RIL 1960
THE Airman
OFFICIAL JOURNAL OF THE ORCE
MEN FOR AEROSPACE - - -
LT. GEN. J. E. BRIGGS page 2

. . . peace be unto you

St. John 20:19

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

Volume IV, Number 4 April 1960

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THE AIRMAN is primarily a medium for the exchange of ideas and information among Air Force personnel. Readers are encouraged to submit articles, short subjects, photographs, and artwork. All contributions will be given consideration; suggestions and criticisms are welcomed. Opinions expressed by individual contributors do not necessarly reflect the official viewpoint of the Department of the Air Force. All photographs are official USAF photos unless otherwise designated.

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LETTERS TO THE EDITOR

Reunion

Sir: The 388th Bombardment Group (H) will hold its annual reunion July 8, 9, and 10 in Port Huron, Mich. Anyone who served with this organization during World War II is cordially invited to attend. The group was part of the 8th Air Force, 3rd Air Division, 45th Bombardment Wing. Those desiring further information can contact the undersigned at 8653 Maple St.

Edward J. Huntzinger
Perrysburg, Ohio

★ ★ ★

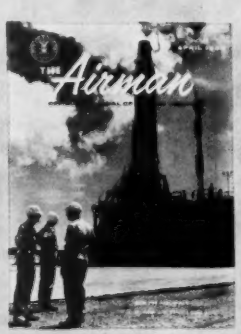
Off-Duty Pilots

Sir: In your January article *The Aero Club Pilot,* you note that such clubs are sanctioned under the provisions of AFR 34-14. However, after reading the regulation, I am still not sure if this applies to air reservists. Coud you please clarify this for me?

Norman Cross
Springfield, Mass.

● *A reservist on full-time active duty with USAF is eligible to participate in Air Force Aero Club activities. However, a reservist who is primarily a civilian is ineligible unless he is either a military dependent or a full-time employee of the Air Force, paid from either appropriated or non-appropriated funds.*

(Continued on page 39)



★ ★ ★

Front Cover: USAF's operational ICBM, the *Atlas,* shown during the early testing period at Cape Canaveral, Fla. ATC now conducts regular training for *Atlas* technicians. *Photo by MSgt. Fred Santomassino.*

Men for Aerospace

by Lt. Gen. James E. Briggs
Commander, Air Training Command

AT THE Farragut Avenue Post Office in small town Vandergrift, Pa., an 18-year-old high school senior stands before an Air Force recruiting poster.

He leafs through a pamphlet on Air Force career opportunities and his face shows the concern of many 18-year-olds: what about a military career?

If he is one of the more than 80,000 nonprior-service men that the Air Force is seeking this year, an Air Force future offers better opportunities than ever before.

And should he be enlisted, he will become an important part of a changing Air Force that has been emerging quietly yet discernibly from the bottom up—an Air Force brought about by awesome design, tugged and molded into a predetermined shape to shoulder Aerospace Age responsibilities.

The Air Force faces a greater challenge today than any military service has faced at any time in history. The preservation of world peace depends greatly on an Aerospace force maintained at tip-toe readiness.

Weapon systems that compose this force have bounded into exotic complexity and our offensive and defensive units are being modernized at an increasing rate. A simple fact applies: *as the job becomes more important and the tools more complex, the need for higher quality manpower increases in direct ratio.*

Add to this fact a provoking question: Can the young man entering the Air Force do the job that will be expected of him?

The answer is a qualified yes. Qualified in that the young airman must be the right man—capable of learning quickly the technical intricacies of modern machines—and qualified in that this man must receive the finest training possible to prepare him quickly and adequately for his task.

Such manpower, the most sought-after commodity in the world, is the one essential without which the Air Force cannot operate. Blended in proper amounts with hardware and services, man makes a weapon system function.

Since August of last year when I assumed command of Air Training Command, I have become increasingly aware of a new Air Force emerging—rising from the grassroots level, from the new airmen entering our membership.

And this—the new airman story—is perhaps the most striking contribution to Air Force revitalization. Chapter one was written two years ago this month when the USAF entered a program of selective recruit-

New recruits enter through Lackland Military Training Center, San Antonio, Texas, for minimum of five weeks' basic military training.

ing. For the first time, we began recruiting aptitudes to match requirements. The program aimed at higher quality first termers, and at preventing untrainable individuals from entering the Air Force.

We needed—as we still do—men with mathematics and science backgrounds, men who could go into technical or highly technical career fields and do what was expected of them.

This recruiting effort, administered by the USAF Recruiting Service—a unit of Air Training Command—has paid off and will become even more valuable to us in the future. Our new airmen are more capable of making significant contributions to the Air Force, and this is the criterion we must depend on as we move to a smaller, more professional force.

Airmen who have been "selectively" recruited:

★ *have a higher educational level.* The percentage of high school graduates entering Air Force ranks has risen sharply from 49 percent in FY 55 to 73 percent in FY 59 and we see the upward trend continuing. Certainly this is significant since high school diplomas are indicative of many things, among the most important of which are initiative, aptitude, purpose, and ability. Further, off-duty college education rates are on the increase in Air Training Command, emphasizing the higher education entry level.

★ *are healthier.* Maj. Gen. O. K. Neiss, USAF Surgeon General, recently said: "Our past twelve months' ratio of non-effectiveness is less than one percent, which is better than ever previously experienced in military history. People in the Air Force are healthier than ever before."

★ *are more interested in the Air Force as a career.* Selective recruiting chooses the right man for the job to which he's best qualified and thus provides reenlistment motivation. Since all airmen enter through Air Training Command, ATC is consciously aware of the essential role it plays in encouraging reenlistment of the most qualified. The selective reenlistment program (a stabilized force of 55 percent careerists—45 percent first termers) set to begin in FY 61 will determine airmen invited for retention by performance, job skill, and future potential. Other USAF personnel programs aimed at increasing opportunities for promotion and professional advancement for needed careerists will add to the reenlistment incentive.

★ *are better behaved.* The ATC offense rate (both civil and military offenses, including AWOLs and

thefts) has dropped from a high of 14.55 per thousand in July '56 to a low of .83 in July three years later. Consistently in the past two years, the monthly rate has been less than one offense per thousand personnel. The number of prisoners confined on ATC bases declined from slightly over a thousand in July '56 to 159 in July '59. Concerning this latter fact, consideration must be given to the decrease in number of bases assigned to ATC from 1956 to 1959; even with this factor, better behavior is irrefutably evident among new airmen.

One in Five

Selective recruiting earmarks a man for enlistment after a series of screening tests given at recruiting offices and examining stations. On an average of every five men initially contacted, only one will be enlisted. In FY 61, for example, more than 400,000 young men will be approached by recruiters so that 80,000-plus can be enlisted.

Tests include the Enlisted Screening Test (broad screening elimination), the Airman Qualifying Examination (to determine enlistment eligibility and aptitudes in selected areas), the Armed Forces Qualification Test (learning ability), and a physical examination.

In a further effort to boost quality of first-term airmen, ATC last February revised the Basic Military Training Program at Lackland Military Training Center to provide more time to weed out the unadaptables who slip through the screening net. This revision extended Phase One training (given all newcomers prior to technical school or directed-duty assignments) an additional week to permit commanders and instructors more opportunity to observe new recruits in a variety of situations. The revision also doubled the amount of physical conditioning for new airmen.

As we obtain more experience with our quality recruiting program, I am certain that we can expect further gains toward our goal of a model and quality airman in the USAF. This is the first task of Air Training Command: assuring that the Air Force gets *the right man for the right job.*

Training is Complex

The second task—that of teaching the young high school or college graduate one of the hundreds of skills required to keep the Aerospace force operational—is even more complex than our constant search for the most trainable men.

The effect that the very rapid advances in weapon technology have had on the Air Force is apparent in the aircraft and missiles we are using and planning to use. What is not so readily apparent is the training responsibility that modern weapon systems impose.

In far-reaching ways, the training program has been critically complicated by advanced technology. One specific example has pointed this out dramatically.

In World War II when we used the P-47, complex fire-control systems were practically non-existent. One of our first operational jets, the F-80B, required seven electronic technicians per squadron to maintain the aircrafts' weapons. These technicians received only 10 weeks of training.

Before entering the ATC instructor corps, selectees receive specialized training in lesson planning, classroom instruction, and fundamentals of military training from veteran ATC instructors. Only men with interest, initiative, and creative ability are picked to teach others.

Today, a squadron of the counterpart aircraft, the F-102, demands 59 such fire-control experts and each man receives 43 weeks of specialized technical training on a system complicated by 4,000 vacuum tubes and 90 "black boxes."

While it is true that electronic advances enable a single air vehicle to accomplish more functions with greater accuracy, they also require more men with greater maintenance skills and know-how to keep these weapon systems operating properly.

Now, missiles are coming of age. And what is true of the airplane in its progressive complexity is equally true of the missile.

In Air Training Command, we are not inventing or developing these systems. Our assignment is to prepare the rank and file of the Air Force to *handle* them.

Man a Must

The world's leap into the Aerospace Age has provided a severe paradox.

Magnificent machines, complex "brains," and glittering hardware have led many of us to the false belief that man is decreasing in importance.

Many of us—both in and out of the military—have taken "people" for granted.

We have tended to assume that they will be available,

trained adequately in the proper skills, whenever and for whatever they are needed.

The truth is that as machines become more sophisticated, they require more and higher quality manpower trained in more advanced skills to support them.

A weapon system by definition consists of three elements: hardware, facilities, and people. An overemphasis of one element—hardware, for example—can be detrimental to the others. Equal attention must be applied to all three to achieve the desired capability of a weapon system.

In the Air Force, we are paying attention to people in many areas. Certainly the move to a more stabilized force, new promotion and career opportunity plans, selective recruiting, and selective reenlistment are personnel-oriented programs.

Modern weapon systems not only demand a reservoir of the most trainable and most qualified people, however. They also require training that will convert individual potential into valued activity.

We must plan for such training and provide it in necessary quantity and of a quality that will guarantee the needed graduates. We must continue to avoid overtraining and training waste.

Timely Training

This is fundamental: *that a weapon system will not be operational nor will it function efficiently unless there has been adequate and timely training.*

Such training is part of the concept of concurrency, a new management concept which necessarily does away with the method of weapon development used in the past.

The older method built a new weapon part by part in a series of consecutive steps. Hand-made prototypes were completed before production tooling was initiated. And then, when the weapon was in near-inventory status, personnel training was begun.

This was a costly, time-consuming process that is not satisfactory in the modern race for the most advanced equipment.

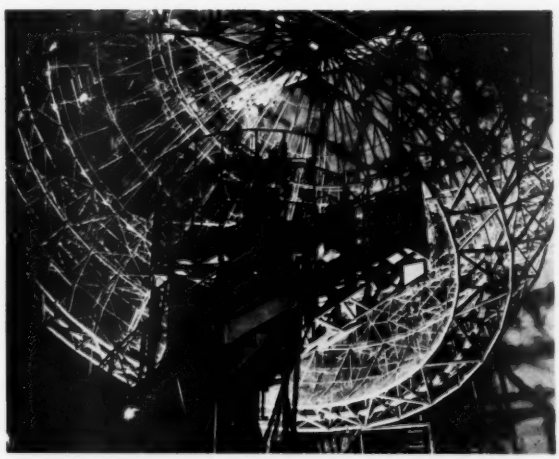
Under the concurrency concept, the normally sequential functions of research, development, test, installation, and finally checkout of a weapon system are compressed and overlapped. This reduces the time span between concept and operational status that would otherwise be lengthy.

If competent personnel are to be ready when the weapon system is ready, training must be concurrent with the system's development, often beginning while the aerospace vehicle is still taking shape on the drawing board.

Accepting this principle is a primary step in placing the proper emphasis on the importance of people to the Aerospace force.

Training under the concurrency concept is new: there are no guides, no textbooks, no long experience. The entire training program must be molded from bare beginnings.

It is difficult to train missilemen, for example, on a weapon system that is continually evolving, continually being developed and improved.



This training aid at Mather AFB, Calif., is actually a model of the northern sky. Strung with electric stars, the sphere revolves to duplicate the changing sky as seen from a passing jet. Mather conducts advanced navigator (navigator-bombardier school) and observer upgrading training.

New Requirements

What is necessary if we are to train able Men for Aerospace? Three elements are vital if needed training is to be accomplished quickly, economically, and as thoroughly as the Age demands.

First, there must be a large enough supply of trainable people, and the Air Force is well off in this respect. Recruiting and reenlistment programs are insuring a personnel force that allows us to be selective in applying the standards imposed by new weapon systems.

The 18-year-old high school senior from Vandergrift, Pa., will find it difficult to enlist in the Air Force, and even more difficult to remain after his first enlistment. He will be retained only if his attitude and performance are consistent with what is expected of him in an Air Force of hand-picked specialists.

Secondly, we must have a qualified and well-motivated instructor corps to guide trainee development. We are ever in need of dedicated instructors, capable men with interest, initiative, and creative ability who have classroom teaching potential.

Top-grade instructors are vital for other reasons also. Training programs for advanced weapon systems require new textbooks and on-the-job training manuals. A select group of well-seasoned instructors is continu-

Amarillo Technical Training Center at Amarillo, Tex., is home of aircraft maintenance schools. In the past nine years, Amarillo has graduated more than 100,000 airmen qualified in a dozen career fields.

ally needed to aid in the planning, writing, and editing of training material. Such material must be updated as quickly as modifications are made to a weapon system.

Finally, skilled instructors along with training administrators are invaluable in making suggestions on training equipment design that will assure a balanced relationship between the design itself and the human element, responsible for the system's operation.

Air Training Command has been probing possible future automated training tools, such as closed-circuit television and "teaching machines," to lick the two-fold problem of (1) supplying training that is as good as present or better, and (2) saving time, money, and scarce instructor manpower. Closed-circuit TV, for example, has been in use for more than a year at Lowry AFB, Colo., and looks most promising as a future standard training device.

No matter the tool, our training aims will remain unchanged: provide each Air Force student with as much individual attention as possible and allow every student to be exposed to the best quality of teaching available.

Thirdly, there must be adequate training equipment and facilities if Air Force students are to report to using commands ready for work.

In many cases, trainees must have the very same equipment to practice on in the classroom that they will find in the field. Others must have access to equipment peculiar to training that will better qualify them for operational duties.

Such classroom equipment includes prototypes or operational subsystems of a weapon, computers, guidance equipment, ground support consoles, data reduction systems, automatic checkout equipment, and ground communications.

Training equipment must be available at the earliest possible time, and it must be modified as elements of the weapon system itself are modified.

It is noteworthy that personnel required for some weapon systems require more lead time than does the hardware itself.

To assure the needed training aids and equipment, "people" must be adequately considered in the initial development plans of a weapon system. Money should be allocated and direction given early enough to provide training equipment at the point in the system's growth when training must begin.

In other words, the principle of concurrency is applicable to the development, assembly, and delivery of training aids and equipment. And the priority for this equipment should be high enough to insure its protection during budget parings.

It is possible to give "paper and pencil" training, but it should be understood that this is a "last resort" effort. Such training graduates a man no more capable of taking his place on a combat crew than a driver training student who reads from a book about an automobile but never is given the opportunity to practice driving until time for his test.

Air Training Command exists to keep combat forces operational. We cannot hinder these forces by saddling them with the responsibility for conducting fundamentals training.

Needed training equipment is not enough. Facilities to house this equipment are also necessary.

The training aids and equipment required by com-

Closed circuit educational television has been in experimental use at Lowry Technical Training Center for more than a year.

plex weapon systems are exotic in themselves. Such equipment demands facilities where sensitive instruments can rest in a dust-free atmosphere, where doors open wide enough to admit huge aircraft and towering missiles, and where power supplies unthought of a decade ago are available at the snap of a switch.

Certainly we cannot expect to house expensive training equipment in buildings constructed to meet the requirements of World War II training programs. Neither can we expect quality graduates to emerge from classrooms that are noisy, dimly lighted, and uncomfortable. Modern classrooms demanded by leaders in the civilian education field are likewise needed in the Air Force training program, the success or failure of which may determine our National security.

As with training equipment, requirements for individual training facilities must be given adequate consideration during the development phase of a new weapon system.

These facilities should be constructed not only to absorb the training needs of the present. They should be built to anticipate modifications of existing weapon systems and of future systems not now requiring training programs.

Missile training construction at Chanute, Keesler, and Sheppard Air Force Bases offers awesome examples of the facilities required for Aerospace Age training.

The new liquid propellant handling center at Chanute required tubing of specially designed stainless steel. A one-and-one-half inch elbow of the special material costs $90. Estimated total cost of propulsion training units at Chanute is $3.9 million.

At Keesler, a new facility was recently completed at a cost of more than $1.3 million. To insure maximum stability for the sensitive equipment to be housed inside, some of the Missile Center's concrete bases nestle more than a hundred feet down into the earth.

Last November, Neel Kearby Hall, a classroom-laboratory structure, was dedicated at Sheppard AFB as part of a $3 million missile training complex. Included in the building is a bay to house three ballistic missiles.

Meeting the Challenge

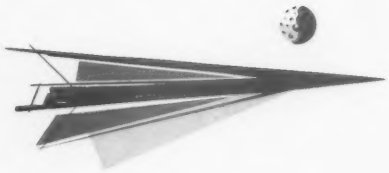
Obviously, training for today's and tomorrow's weapon systems is costly. Expense must be measured in the value of the skilled manpower that quality training produces and by the principle that the human ingredient makes a weapon system operational.

Raw Air Force manpower has a higher degree of potential today than ever before, a fortunate position due largely to selective recruiting and reenlistment controls.

To make effective use of this potential, this manpower must receive timely training of a degree consistent with the demands of our present and future weapon systems.

The 18-year-old high school senior from Vandergrift, Pa., if tapped by the Air Force as the "right man," and the thousands like him who make up the ranks of our Aerospace force, must receive the very best training possible.

Equal consideration and equal development of the three major elements of a weapon system will provide the necessary men in the right numbers and with the right training to meet the Aerospace Age challenge.



It takes twenty centuries for Nature
to recycle the organic and inorganic matter of life on Earth.
To support life in space,
scientists who dare to dream of man on the Moon
must compress the cycle into hours.

2,000 YEARS

A TRIP to the Moon won't take long—roughly five and a half days. That's about the same time it takes a luxury cruise ship to go from California to Hawaii. But there similarity ends.

The unclouded Moon days are 13 times longer than Hawaiian days and Moon beaches are about 200 degrees warmer than Waikiki. Moon nights are cooler too; always clear, with a low around minus 186 degrees, no humidity, no wind, no pounding surf, not even water.

Instead of flower-scented breezes that rustle palm leaves and flirt with grass skirts, the Moon traveler will have at most a roomful of fan-stirred atmosphere consisting mainly of less pleasant smelling oxygen that he will breathe over and over. The only sounds will be in his earphones—he hopes.

So why not go to Hawaii instead of the Moon?

Well, Hawaii wasn't so heavenly nearly 200 years ago when Captain Cook first discovered it—and lost his head. It took a lot of conditioning by missionaries and promoters to make it the most important crossroads and watering place in the Pacific Ocean and the present State of Heavenly Flowers. Col. Paul A. Campbell, Assistant for Advanced Studies to the commander of the USAF Aerospace Medical Center, believes that the Moon will be to interplanetary space travel what Hawaii is to the Pacific—a pleasant stopover to refuel and rest.

The Moon, just one and a third light-seconds away (240,000 miles) is not only airless, its gravity is only one-sixth that of the Earth. Escape velocity from the Earth is seven miles per second; from the Moon it is only one and a half miles per second. So, tremendous, nonstreamlined rocket ships, equipped to cruise space for months or years, could blast off the Moon with relatively little power. A Moon colony fitted out with food, water, and an artificial atmosphere would be an ideal research laboratory and staging area for space exploration.

Colonel Campbell, a medical doctor and teacher of medical science, has spent nearly 20 years doing advanced medical research on problems peculiar to aviators and astronauts. Right now at Brooks AFB, Tex., he and many other researchers in every scientific discipline, are concerned with means of supporting man in a space environment.

Assuming that engineers will soon solve the logistical problem of how to get man to the Moon and back, the medical problem is how to keep him alive. The Moon-bound man will have to take with him more than a toothbrush and socks. He will need a piece of the Earth's atmospheric shell, plus the proper chemical and physical means to keep it repaired, Dr. Dan Keller told the country's top space-minded doctors recently. Captain Keller is one of the researchers at the Aerospace Medical Center who is studying closed space

S IN A DAY

Story and photos by MSgt. Edison T. Blair, *Airman Staff*

cabin simulator atmospheres.

There's nothing new about breathing the same air over and over and eating the same food again and again. Animals have been doing it since life started on Earth. Matter is never destroyed, it is simply transformed. Animals inhale oxygen (O_2) that converts food into new cell life, and exhale carbon dioxide (CO_2) and water vapor. They excrete other metabolic waste that is broken down into different forms by bacterial and chemical action. Green plants thrive on these organic wastes and through the processes of biochemistry and photosynthesis reconvert it to food and oxygen.

Balanced System

Every year, sun-aided plants, through photosynthesis, take nearly 200 billion tons of carbon from atmospheric and water-suspended CO_2, combine it with hydrogen and nitrogen into useful, complex organic molecules, and release oxygen. It takes 300 years to cycle all the Earth's carbon dioxide, from exhalation through decay of organic matter. The Earth's entire oxygen supply is recycled this way every 2,000 years. Thus the Earth has what is known as a balanced, or closed, ecological system.

Man on the Moon, or anywhere in airless space, must carry such a balanced system with him or periodically trade in the used portion for new air, food, and water. A man consumes approximately two pounds of oxygen, four pounds of food, and four pounds of water per day and his body produces about the same amount of metabolic waste. Cost per pound of payload in terms of launching weight from the Earth makes this expensive. And despite the telescoping of time, man couldn't wait 2,000 years for his daily sustenance.

The cheapest solution is to reduce a closed ecological system to space-cabin size with a *proportionate cycling time*. Space medicine scientists at the Aerospace Medical Center are trying to do this now. They will prove as much of the system as possible in the laboratory but the ultimate test will be made in space after scientists are 98 percent sure it will work. And Dr. Jack Myers, University of Texas researcher who has done experimental ecological studies under contract for USAF, says that the problems of closed ecological systems will be solved before we solve the human relations problems on Earth.

It has been estimated that nine-tenths or more of the 200 billion tons of carbon fixed yearly by photosynthesis comes from the upper levels of ponds, rivers, and the ocean. Green plants in the ocean? Yes, seaweed and other forms of algae live in water. They are bio-physical machines on the molecular level, meshed with the Earth's total metabolism, that have been grinding away for millions of years. Fossils, believed to be a form of blue-green algae, have been found in

Dr. Campbell points to the longest of many medical bridges that man must build between the Earth and the Moon.

strata 1.5 billion years old. So far, algae have proved to be the most efficient photosynthesizing mechanisms that man has been able to find. The green and green-yellow chlorella varieties found in most ponds and pools are about 19 percent efficient as gas exchangers.

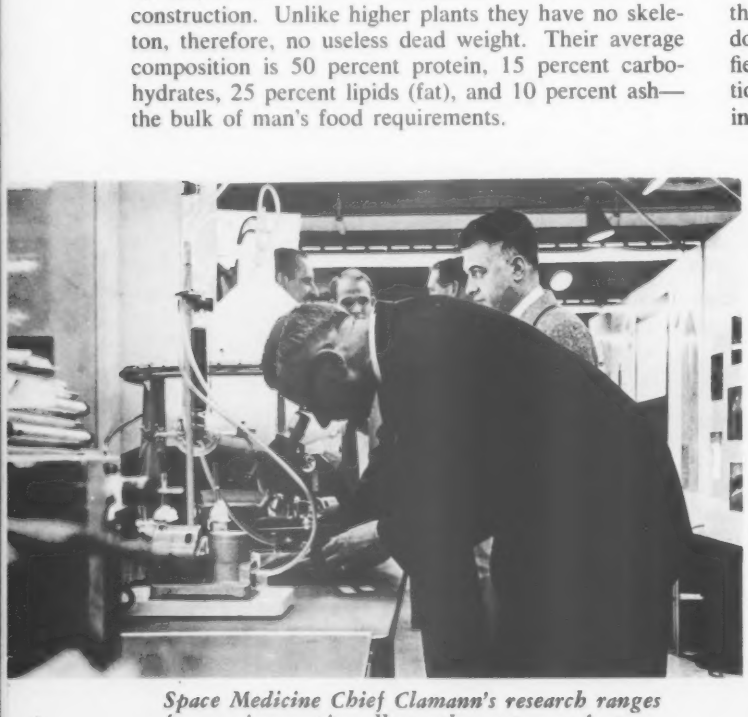
Algae vary in size from tiny micro-organisms to a specie of seaweed that grows to 600 feet. Since space travel demands miniaturization, study is concentrated on micro varieties with a laminar or scale-like cell construction. Unlike higher plants they have no skeleton, therefore, no useless dead weight. Their average composition is 50 percent protein, 15 percent carbohydrates, 25 percent lipids (fat), and 10 percent ash—the bulk of man's food requirements.

The photosynthesis and growth of all species of algae are controlled by two important conditions—light intensity and carbon dioxide concentration. Dr. Myers thinks that five pounds of fresh algae growing under optimum conditions will supply a man's daily oxygen (600 liters) needs. It will also grow at a compound interest rate of four to eight percent, doubling its cell weight daily. When balanced in a closed system to use all the CO_2 available, the plants will produce more oxygen and far more protein than man needs.

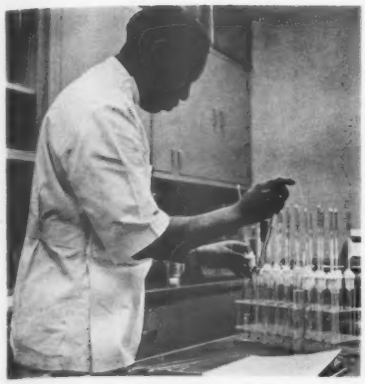
But the algae need more than carbon dioxide and water. They need food; specifically nitrogen, carbon, phosphorous, potassium, and a few other elements. It wasn't by coincidence that the Designer of Earth's metabolic and ecological systems included just such elements in the body wastes of man and other animals. These wastes must certainly be disposed of in a space ship or lunar colony and what better way than feeding the plants?

For psychological and esthetic, if not for chemical reasons, feces will be incinerated or treated in some other way before it is added to the algae culture. Dr. James E. Moyer, a young micro-biologist at the center, is studying sewage disposal by the activated sludge process. Liquids produced in the process are known to be high in nitrogen salts. Bacteria that thrive on the methane and hydrogen gases produced use some oxygen to decompose fecal solids and convert them to organic compounds just as they do more slowly in nature. These bacteria can accomplish some delicate conversions better than can be done chemically.

Captain Moyer will try to find a way to balance the gases so that nothing is wasted, and to learn if the fecal bacteria are harmful to algae. If it can be done, then the system must be miniaturized. A modified system combining chemical treatment, incineration, dehydration, and storage is presently being used in the two-man space cabin simulator in the space



Space Medicine Chief Clamann's research ranges from microscopic cells to the vastness of space.



In a carefully controlled test-tube environment algae live, die, and thrive on measured drops of food supplied here by SSgt. Y. Z. Lewis.

In the Labs at Brooks machinists and medics are teammates in man's assault on space.

medical laboratory. But to date, not much experimental work has been done on the recycling of feces.

The recycling of metabolic water, particularly urine, has been done easily in the laboratory through a distillation process. Reuse of metabolic water is now common in space cabin simulator runs and except for the flat taste common to all distilled water, it is otherwise potable. It has been definitely proven that urea, which is high in nitrogen content, not only promotes cell growth in chlorella, but the cells produced are higher in protein and lower in carbohydrates and fat.

In one corner of the Space Medicine Laboratory Dr. Jack Bates is successfully feeding algae that shows a good rate of growth on raw urine. This method might further simplify the distillation process. At least four species he has under culture have shown good growth on urine, fecal material, and water. Captain Bates is also planting daphnia, almost microscopic water fleas, in an algae culture to see if they might harvest some of the excess algae cells. If daphnia can live and multiply this way perhaps another micro-animal, or even fish, might be introduced to harvest the daphnia. They could lengthen and stabilize the ecological loop and add variety to the spaceman's diet.

In another rack of test tubes, Bates and his pretty wife Betty, who is a micro-biologist at the center, are experimenting with other plant foods to test algae's rate of growth. The couple, along with Captain Keller, have conducted experiments with rats that breathed algae-produced oxygen for long periods while confined at a pressure altitude of 34,000 feet. If the rats suffer no ill effects they will try to extend the experiments later to include growing algae under the same conditions. Dr. Bruno Balke, another physiologist, studies human conditioning to high altitudes and low pressure. Perhaps the shells of space cabins could be made thinner with a resultant increase in payload if both man and algae can adapt to lower pressures.

The Drs. Bates study effects of photosynthesized oxygen on rats in simulated space.

But Dr. Bates' immediate primary goal is to cultivate an algae culture big enough to support a man for long periods in a space cabin simulator. Helping him is A/1C Neal Benz, an Air Force-trained machinist from Hendricks, Minn. Benz works in the shops where doctors and electronic technicians, physiologists and glassblowers, biologists and machinists team up to design and build mouse-back radio transmitters, telemetry electrodes, gas sensors, and weird looking lab equipment.

"It gives me a lot of satisfaction," Benz says, "to use my imagination instead of doing routine milling, shaping and boring. I have a lot of confidence in this piece of equipment."

The captain had explained to the airman what was needed; a clear plastic tank of a specified capacity, containing a certain number of clear plastic tubes that would hold fluorescent lamps, so that when the outside of the tank was also fitted with fluorescent lights, all the liquid within the tank would be equidistant from a light source. Airman Benz came up with a drawing, the two of them worked out the details, and Benz began construction of a man-sized photosynthetic gas exchanger.

But even if the gas exchanger works and the algae produces enough oxygen to support a man inside a sealed cabin it doesn't mean that man is ready to blast off for the Moon with the thing strapped to his back like a skin diver after abalone. The rig will be too big and bulky—like the food pills Dr. Hans G. Clamann,

Dr. Jack Myers, University of Texas researcher, quizzically examines new SAM gas exchanger designed to expose more algae cells to light more often.

chief of Space Medicine, admits are possible. The trouble with food pills, Dr. Clamann says, is that no one can swallow a one-pound pill.

Remember the light conditions for algae growth? Myers' experiments have shown that algae must be suspended in turbulent water with a low surface intensity over a *nine-square-meter* lighted area to supply a man's daily oxygen needs. Engineering principles cannot be ignored and such an apparatus just isn't feasible in a space craft now. But although gas exchangers won't be a shelf item of hardware for some time yet, they have no theoretical limits. The problem can be solved, Dr. Clamann contends, but only by incessantly inventive experimental studies.

But every solution produces a new generation of problems. Weightlessness, for instance, is a many-faceted problem. Before gas exchange can take place during photosynthesis, gas molecules must touch the cells. To speed up the process to optimum efficiency, gas should be bubbled through the suspension. But bubbles don't form and the suspension isn't agitated in zero gravity. G-forces generated by acceleration could create an artificial gravity but this, or any type of artificial gravity, requires a power source and more weight in fuel and structure.

Sunlight, which is readily available in cloudless space, is no real bargain either. Algae grow best with only 500 foot-candles of light. Even the sunlight filtered by the atmosphere arrives on the Earth's surface about 10,000 foot-candles strong. Direct, undiffused sunlight outside Earth's atmosphere is 40 percent stronger while the shadows are black. There is nothing in between the extremes. Sunlight harnessed by solar batteries and converted to electrical energy is more efficient, but that too involves more weight and equipment. Success or failure of space missions can be measured in ounces and cubic inches.

Despite the appearance that each solution spawns a bigger family of problems than before, scientists at Brooks are noted for their optimism. Experiments already concluded there indicate that liquid oxygen systems, or chemicals such as hydrogen peroxide, potassium superoxide, or sodium chlorate could provide a workable atmosphere for weeks. Recycling water is simple. Food—dehydrated, packaged in edible containers, or extruded from squeeze bottles—could be stored longer. Thus a non-regenerative system would sustain man on a trip to the Moon and back, perhaps long enough for him to plant a lunar colony there.

Meanwhile, a closed algae system could be applied to a one-man simulator in the laboratory. When perfected, it could be applied to a two-man space cabin simulator. Later the simulator and its system could be moved into a larger chamber such as those used for altitude simulation in the Altitude Laboratory. There as much as possible of the environment of space could be simulated in relative safety. The experimental subjects would pass through locks and set up a bubble colony within the large chamber and close most of the ecological loop.

All except the effects of gravity and radiation could be simulated and proven in the laboratory. Then the system could be moved piecemeal to the Moon. It would be housed underground where the temperature averages minus 30 degrees to avoid the surface extremes. Such a cave dwelling could be sealed off with a minimum of materials. Solar energy could be piped from the surface for heat and power. With the system in full operation, further expansion of the original chamber could be accomplished in a favorable environment.

Broad-leaved plants would probably be added to the system while still in the altitude chamber, then aquatic animals and eventually herbivorous animals, to feed on the plants. An ecological system approaching, if not duplicating, that of Earth would be created. Moon soil seasoned with the necessary gases and organic wastes might itself contribute to a still better environment. Hydrogen and oxygen compounds in the Moon's crust might yield more oxygen and water. Other materials might be recovered that would aid man's conquest of space.

Thus it may come to pass that the lowly algae, until now scorned by man, will be the key to man's conquest of space and open the door to greater knowledge of the universe. It may never be as lovely as a swaying coconut palm, but it is certainly more functional.

USAF C-130 flew "Alice" and friends to Korean orphans' home. Nucleus for beef and dairy herds was provided by Texans like ranch expert Red Hannah.

". . . the worth of the People-to-People contacts confirms my deep-seated conviction that there is no work more vital to the peace and welfare of all nations than that which we can accomplish through this program."

PRESIDENT DWIGHT D. EISENHOWER

THE FRIENDLY AIRMAN

by Dave Karten, *Airman Staff*

AIR FORCE personnel and their dependents abroad are helping build new roads to international understanding.

With sympathy, imagination, talent, and just plain common sense, they are painting a great canvas of friendship, smashing barriers of hostility, and capturing the hearts of our foreign hosts.

The USAF "good neighbor" effort ranges from vast rescue and assistance projects to innumerable small gestures that warm the hearts of those who might have turned against us.

Sometimes the act of kindness is an organized base or command effort. Frequently it is the spontaneous reaction of an individual to the needs of someone else.

In Japan, Air Force doctors, lawyers, nurses, engineers, and other specialists join Japanese professional societies with some remarkable results. When certain illnesses of local origin appeared among Air Force men, the Japanese doctors suggested remedies. When Japanese civil engineers complained of a bad traffic intersection in town which was causing accidents, Air Force engineers brought in heavy grading equipment and helped build a new road.

Japanese women hold classes in flower arrangement for Air Force wives. In return, the American women conduct a course in how to run a U. S.-style home.

At Burtonwood, England, Air Force high school teen-agers recently teamed up with Queen's Counselor Sir Norman Birkett on a "Life In England and America" quiz over the British TV network and did much to dispel misconceptions about both countries.

In Wiesbaden, Germany, the student council of Gen. Henry H. Arnold High School for Air Force personnel sponsored a drive that raised clothing, books, and toys for Dr. Schweitzer's Hospital at Lambarene, Africa.

Another Dr. Schweitzer fan in Naples, the 13-year-old son of an Air Force staff sergeant, did even more. After listening to his dad talk about Dr. Schweitzer's selfless dedication to treating the sick of French Equatorial Africa, Bobby Hill wrote a letter to Lt. Gen. Richard C. Lindsay, Commander of NATO's Allied Air Force, Southern Europe.

"I want to help Dr. Schweitzer," he wrote. "I have asked my father to buy me some medicine. He told me he would buy as much as he can if a way is found to have it delivered . . ."

"Your planes, if they go where Dr. Schweitzer is, could deliver the medicine for me. Maybe others will feel what I feel and offer medicine too."

Many others did. General Lindsay endorsed the project. The Italian press gave it wide publicity and contributions poured in. Italian pharmaceutical firms contributed generously.

The result: $400,000 worth of medical supplies flown to Lambarene with Bobby Hill aboard. Meeting the plane to express his thanks was Dr. Albert Schweitzer.

The universal language of music is also helping break down barriers to friendship and understanding abroad. Groups of children and adults in several of the countries where USAF personnel are stationed, sing together in glee clubs and choirs.

Under-privileged children of Nancy, France, benefit by a summer camp built by two USAF sergeants in their spare time. At Sembach, Germany, burgomeisters have gate passes to the base, implementing an open-door policy. A soccer field is built for the community, an

LIBYAN LAD *gets a Wheelus AB renovated toy from MSgt. Burkhardt.*

ARAB CHILDREN *watch erection of surplus Dallas huts donated to Moroccan school by Nouasseur AB to relieve overcrowded classrooms.*

FRIENDLY AIRMAN

Air Force crane is brought in to put the bell on a church at Winnweiler.

Twenty-five Ethiopian children, all malnutrition patients at the Itege Menen Hospital in Asmara, Eritrea (Ethiopia) are being provided fresh milk as a much needed supplement to their daily diet thanks to a "Milk Fund" plan of the 7244th Supply Squadron at Dhahran Airfield, Saudi Arabia.

Captain Jack

In 1958, Capt. Jack H. Capers began waving to the Spanish children along the 485-mile pipeline he patrols in an L-20. Later, he began dropping them candy.

Word spread quickly. Soon hundreds of children from Spain's mountains and plains began to look for Captain "Jack" and his silver bird that rained sweets from the sky.

The value and importance of such acts of kindness and understanding can hardly be overestimated. Why?

Well, this is the way President Eisenhower put it when the People-to-People program was getting started in 1956:

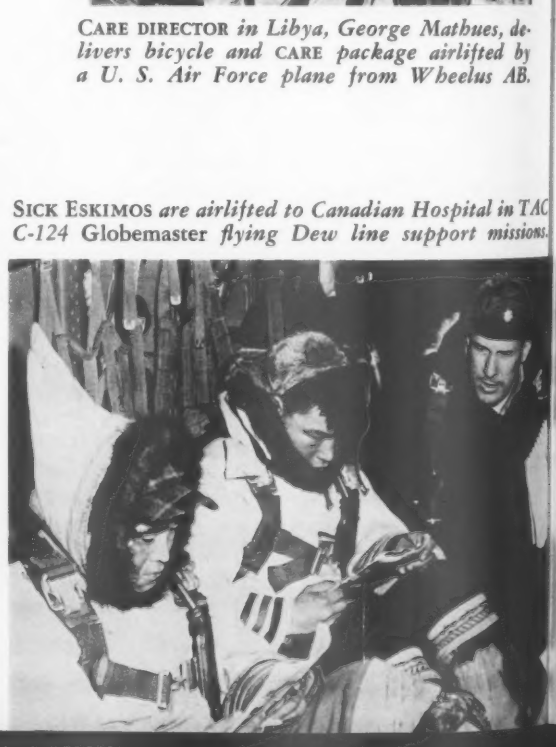
"If our American ideology is eventually to win out in the great struggle being waged between opposing ways of life, it must have the active support of thousands of independent private groups and institutions and millions of individual Americans acting through person-to-person communications in foreign lands."

The airman has a key role to play in this operation, for he's likely to come in contact with more people from foreign countries in just one overseas tour than most other Americans are likely to in a lifetime.

Simply stated the People-to-People program is nothing more than an overseas version of the old American idea of being a "good neighbor." When contacts are warm and friendly and result in mutual respect, they contribute to good relations between our countries. This in turn helps National security; gains precious objectives on the way to world peace.

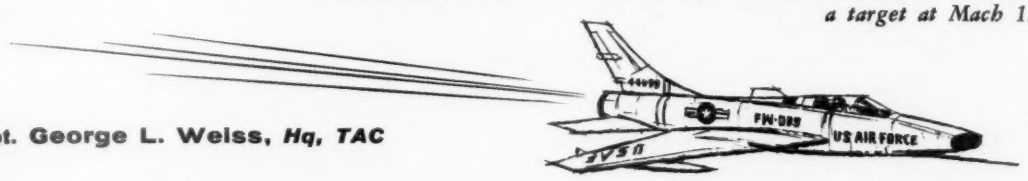
CARE DIRECTOR *in Libya, George Mathues, delivers bicycle and* CARE *package airlifted by a U. S. Air Force plane from Wheelus AB.*

SICK ESKIMOS *are airlifted to Canadian Hospital in TAC C-124* Globemaster *flying Dew line support missions.*



Mach Attack

"Look, Ma, no hands!" the kids say. But no bicycle ever A-bombed a target at Mach 1.5.



by Capt. George L. Weiss, *Hq, TAC*

Approaching the Norfolk-Newport News, Virginia area at 45,000 feet our F-100 nibbled at the Mach. We were nearly supersonic and the instruments fluttered slightly as we nudged Mach 1. Far ahead of us across many miles of Atlantic Ocean was the Chesapeake Bay area, home of the Atlantic Fleet and the Commander of the NATO Fleet; the Continental Army Command at Old Point Comfort; Fort Eustis, headquarters of the Army's Transportation Corps; Tactical Air Command Headquarters at Langley AFB, and the cities of the Peninsula.

The sound of the pilot's even breathing coming through my earphones was briefly interrupted as he pointed out that somewhere west of us was our target.

Major "Robbie" Risner, veteran TAC pilot with a string of MIG-15s to his credit from Korea plus some postwar speed and distance records in his name, then asked, "This is the place. Think you still want to go through with it?"

"That's what I'm here for. Any time you're ready I am," I fired back. I really wasn't, but I had climbed into his F-100F at Langley AFB to see how tactical fighters could deliver an atomic attack against a well-defended target should the occasion ever arise.

While I was contemplating the wisdom of my decision of some 45 minutes ago, "Robbie" rolled the F-100 over on its back. The needles on the instrument panel told us we had slid through the Mach.

I lifted my eyes toward the back of Robinson's head and was startled to see it displayed against a slate-colored background. That slate background was the Atlantic. We were going straight down. I glanced again at the instruments and saw the Mach meter creep past Mach 1.1, 1.2, and up slowly to 1.5—one and a half times the speed of sound.

Now the ocean seemed to come alive. No longer was it 45,000 feet down while we glided almost soundlessly across the "two-toned" sky of the purple twilight at that altitude. This ocean had whitecaps and ships, was dead ahead of us, and coming up like a scene in the "zoom" lens of a movie camera.

Robinson began his pull out, easing the tactical fighter into level flight. My head felt like it was around my belt buckle.

When I straightened up in the cockpit and looked out we seemed to be inches over the water and going at a fantastic rate of speed. Low enough, Risner said, to evade coastline radar and fast enough to evade anything that might spot us from the air.

Risner was quiet now, and I had nothing to say. I was dumfounded by this new experience. Supersonic, a few feet "above the deck," and on a simulated Low Altitude Bombing System run known as LABS.

There was nothing on the bomb shackles under our wings but had we been approaching an enemy target in wartime there would have been a tactical A-bomb riding there, waiting for permission to do its job.

The matter-of-fact voice of the pilot filtered back to me. "In a few minutes we should reach our first check point. At that time I'll set up the automatic pilot. When we reach the second check point I'll turn it over to the airplane."

Somewhere in the space of the next few minutes as we thundered toward Chesapeake Bay, we reached that check point, blurred beyond recognition to the layman in the back seat. This couldn't possibly be real, I kept thinking. Then suddenly I was shocked into reality. Ahead of me in this screaming beast, Risner's hands went straight into the air, touching the canopy above his head as he turned half way towards me. "Look, Ma, no hands! If this thing works right," he grinned with his eyes, "we should complete a fully automatic LABS maneuver. From now on it doesn't matter whether we are dead or alive, our little black boxes are running the show. As long as this airplane holds together we will complete our mission."

I couldn't take my eyes off those hands on the canopy. I could almost feel the waves slapping at the bottom of that F-100.

Then, with only a slight tremor, we began to lift, the nose tilted slightly. I heard Risner say, "Here we go."

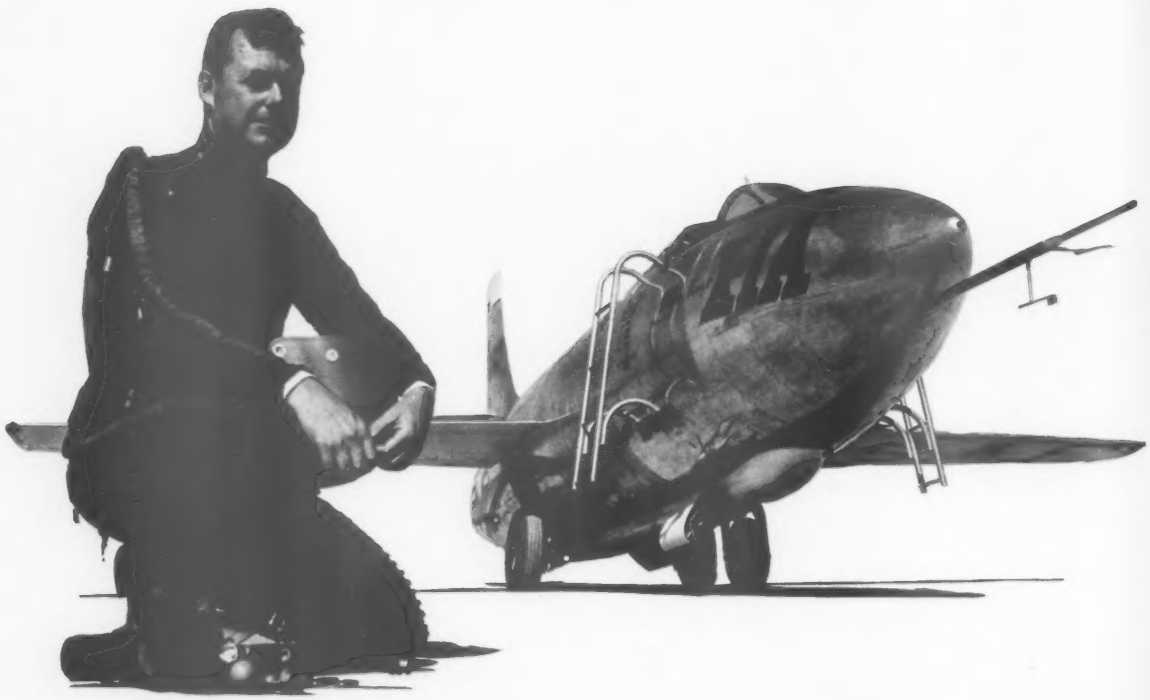
Suddenly everything got grey—just as it did during the pull out. The nose kept going up. The G-forces finally began to decrease and I felt as light as a feather. I looked out. Norfolk, Newport News, the entire Hampton Roads area, was falling away.

"Bombs away," sang out my pilot. Still we kept going up. Straight up. Then as we neared our original altitude the world spun. I gripped my seat armrest and relaxed when I realized we had rolled upright from the top of a loop that began at almost zero altitude and ended at over 20,000 feet.

Now we were headed back out to sea. I asked where the "bomb" was.

"If we had carried one," Risner said, "it would still be going straight up. In a while it will begin its fall straight down over the point where we pulled up."

And that would be the end of a military target.



Test Pilots are Tops

Smart, aggressive, and dedicated describes the men who master USAF's Test Pilot School.

by 1st Lt. Brian T. Sheehan, *Airman Staff*

One day last month a 30-year-old captain lifted his red-nosed F-86 *Sabrejet* off the runway at ARDC's Edwards AFB, Calif., and climbed to 30,000 feet over the sun-baked Mojave desert. He leveled off, then suddenly kicked the aircraft into a dangerous, whipping spin.

Calmly, the nervy fighter pilot spoke into a tiny tape recorder mike as the aircraft dropped toward earth. *Here we go . . . fast pull to the right now . . . wings level after one turn . . . nose down 20 degrees . . . two turns . . . nose down 40 degrees . . . three turns . . . four turns . . . opposite rudder . . . one more turn . . . recovering 20,000 feet . . . coming home.*

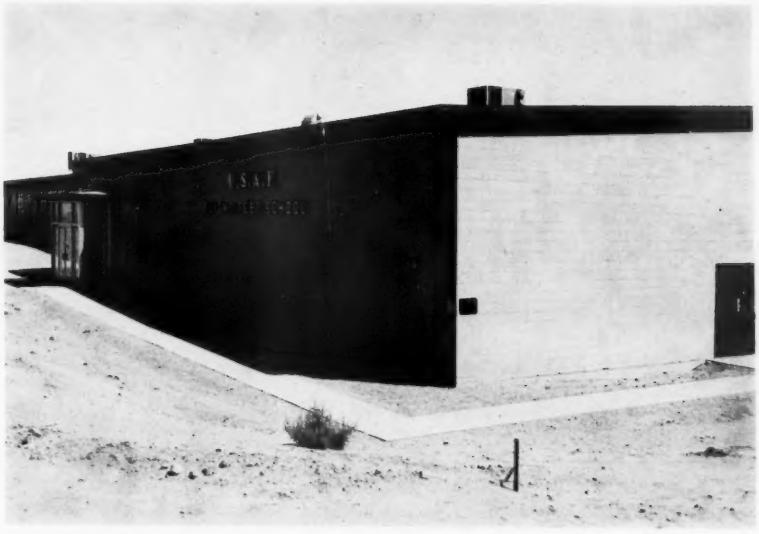
Nosing a jet into a 10,000-foot spin isn't recommended for most pilots, but this captain just wasn't "any" pilot. He was one of 16 new students in a class at the Air Force's Experimental Flight Test Pilot School. As part of his training he was purposely putting his aircraft through a stability and control test and learning to tape-record his reactions to the jet's handling characteristics during the five-turn spin.

Such students aren't at Edwards to spin jets, break the sound barrier, or crack speed records for kicks. Instead, they're there to learn the dead-serious business of becoming an expert Air Force test pilot.

Before a pilot can be considered for test pilot school he has to meet a long list of stringent academic and professional requirements. He must be a pilot on active duty with more than 1,500 flying hours in different aircraft. He must be in perfect physical condition, hold the rank of lieutenant, captain, or major and be between the ages of 25 and 33.

And the potential test flyer must nearly be an "egghead." He should have a good working knowledge of mathematics through differential calculus, aeronautical engineering, and aerodynamics.

If a pilot can meet these rugged qualifications, and is selected for the intensive program, he reports to



FORMER STUDENT, *Maj. Arthur Murray, once flew rocket-powered X-1A to over 90,000 feet for altitude record. Test flying is exciting, precision work.*

HOME OF *USAF Flight Test School is only 100 yards from Edwards AFB flightline. Classrooms, lockers, and administrative offices are located here.*

Edwards to begin eight months of grueling academic and flight training. He goes to Edwards, the home of the flight test school since 1951 (it was previously located at Wright-Patterson AFB, Ohio) because flying conditions there are unexcelled for test work.

At Edwards a test pilot student can fly almost 365 days a year because of the weather and if he has an emergency in the air, he has a 12-mile-long, smooth-as-glass lake bed to set down on. The lake bed, called Rogers Dry Lake, is hard and dry 10 months of the year and can support pressures of over 251 pounds per square inch. Even a heavy B-52 *Stratofort* could land there successfully.

When pilots arrive at Edwards they learn their long program is divided into two 16-week parts. The test pilot school's first part, called the "performance phase," consists of tough classroom work and precision flying. The academic program covers instruction in physics and calculus, followed by courses in basic and supersonic aerodynamics, powerplants, and flight test. Students get 360 hours of drill in these subjects.

They also get first semester "spare time" projects. Students are required to participate in group study classes that discuss different facets of flight test work. The group selects a subject, writes a report, and gives the completed study to test pilot school instructors. Each student is graded on his project contribution.

While the student works on his special project and attends class he logs 80 hours' flying time, studying flight test procedures in the T-28, T-33, F-86, and TF-102. He receives a demonstration ride in each "bird" before flying a dozen tricky aerial maneuvers. The student learns to scream his aircraft 30 feet off the ground at speeds approaching Mach 1 for calibration tests. He learns every idiosyncrasy of his four aircraft while putting them through flight tests like the saw-tooth climb, power stall, and tower fly-by.

During this initial part of the program, the student is up every morning by 5:30 and usually in the air an hour or so later. He flies then because that's when the air is calmest over the huge desert area. Mornings he doesn't fly he studies for afternoon classes which begin at 1:30 and end by 4:30.

Second Semester

After the student completes the four months of the "performance phase," he graduates to the more complex "stability and control phase" of test pilot school.

Here again the test pilot student divides his time between books and flying. His classroom work includes courses in static stability and control theory where he explores the effects of high speeds on aircraft surfaces.

As in the first semester, the student must have an outside-of-class project, but this time he tackles it alone. He receives no help with his subject matter, problem-approach methods, test techniques, aircraft instrumentation, or flight scheduling. In effect he is a test project officer solving a typical test pilot's problem.

His flying training is tied directly to what he learns in class and on his "solo" special project. So he goes into the air and stalls the B-57, does sideslips in the T-33, and aileron rolls in both the T-33 jet trainer and B-57 twin jet bomber. These are among the 11 flying maneuvers he masters while chalking up 65 hours in the air.

During his eight-month course the student finds his time belongs to everyone but himself. He writes reports on 11 flight projects and gathers information for these reports by four methods.

When the student is airborne he must accurately note every detail of his aircraft's performance. To do this he can (1) jot down notes on a board; (2) speak into a tape recorder which he can play back on the ground; (3) turn on a special camera that will photo-

graph the aircraft's instrument panel during flight, or (4) use an oscilligraph (an instrument that accurately charts how the aircraft performed in the air). Once back from his flight the student takes the data, analyzes it, reduces it to clear facts and figures and then writes a flight test report.

But the road to a test pilot rating is academically bumpy, and students must be on their intellectual toes to pass the course. If they don't study they won't be in school long. Usually one man in every two classes "washes out" and five men in one class once "washed."

Every Friday afternoon student test pilots take exams that last three hours. Daily "pop quizzes" insure they've done their homework the night before. The average student spends two hours a night studying for his classroom courses, and puts in two additional daytime hours writing flight test reports. Sandwiched between all this are twice-weekly physical training periods that keep students fit as they are smart. Test pilot instructors know a man in poor physical shape can't stand the G-forces sometimes required in test work.

Students are Smart

It takes plenty of gray matter to get through such a course, and without extensive engineering backgrounds most students couldn't make it. "Our graduates must be able to talk with aeronautical engineers on any subject pertaining to flight test," said Capt. Tom Stafford, a performance section instructor and graduate of the U. S. Naval Academy. "This means they receive the equivalent of four years of college engineering in eight months. It's a killer course."

A few industrious student pilots who didn't possess an engineering background have passed the course. Three college English majors, two agriculture students, and a music major are among those who have graduated successfully. But their high IQs and good study habits made the difference.

The school's seven instructors are good examples of what it takes to become a top-notch test pilot. Most have masters degrees in engineering, and all are graduates of the Air Force's Experimental Flight Test Pilot School. The school commandant, Maj. Richard C. Lathrop, holds a Ph.D. degree in electrical engineering from the University of Minnesota. He's a graduate of the test pilot school and is checked out in a dozen conventional and jet aircraft.

STUDENTS AND INSTRUCTORS *talk over mission before climbing into F-102s for aircraft performance tests. Students fly in morning, attend classes in afternoon.*

FOREIGN STUDENTS, *like this NATO air force officer, often attend eight-month test pilot course. They receive expert advice from the school's seven academic and flight instructors.*

Student (sitting) checks motion pictures of aircraft instrument panel taken during flight. This is one way students gather accurate flight information.

Major Lathrop explained the special qualities required of a good test pilot. "The test pilot must be more than a skillful flyer," said the major, "because aircraft testing today is a precision, professional job. He must also be a competent engineer, a man who stands midway between the men who design our aircraft and the men who fly them. He should accurately be called a pilot-engineer."

His competent staff endeavors to turn out such men, and this means they study more and work harder than their students. "So many new flight test developments take place everyday that we must spend a great deal of time doing research, aside from teaching and flying," said civilian instructor Bill Schweikhard. "We even write our own textbooks, because most books on this subject are three to five years obsolete."

Not all students studying under instructors like Bill Schweikhard are U. S. Air Force officers. In one recent class of 16 graduates two men were members of the Norwegian Air Force, one was an Italian Air Force fighter pilot, one a Federal Aviation Agency check pilot, and another an aircraft corporation test pilot. A certain percentage of foreign air officers from NATO and SEATO countries are included in nearly every class.

Although some Air Force officer graduates of the school are assigned to Edwards most go to other ARDC bases such as Wright Air Development Center, Eglin AFB, Holloman AFB, or Patrick AFB. One graduate is usually assigned to SAC while another goes to TAC.

When a student leaves Edwards he takes a "masters degree" of flight test know-how with him. Essentially, he has learned why his aircraft performs as it does every instant from take-off to landing. He has developed a system to meet every air emergency, and where there is no checklist for a particular problem he invents one. He gambles his life on his ability to make correct decisions under pressure.

But all this knowledge doesn't mean the new test pilot gets himself shot to the moon, strapped into a new Mach 4 fighter, or ejected out of a space satellite at his new base. He might not even fly jet aircraft, and if he does, he won't be doing barrel rolls 50 feet off the deck.

As a test pilot on duty at a base or with a command test section he will usually be called upon to check the performance characteristics of aircraft already in the Air Force inventory. In rare instances something entirely new will come along to be checked, but his odds

Civilian and military test pilots compare flight techniques prior to local mission. Men selected to attend school are considered among top one percent of all pilots.

at flying it are about 100 to one. Someone at the Air Force's Flight Test Center will probably get first crack.

But the test pilot teaches other base pilots the correct techniques of evaluating aircraft performance data and shows them how to write complete, factual reports. The test pilot may serve as a liaison officer between a new tactical unit and ARDC on special maintenance problems or test ride base or command aircraft that have developed "bugs."

Such flying requires courage on the part of test pilots, and they have it long before attending test pilot school. Their job, by nature, demands exploring the unknowns of flight and it can be dangerous. Edwards AFB is named for Capt. Glen W. Edwards, who lost his life while testing a YB-49 "Flying Wing" in 1949.

However, aircraft accidents in flight test work are rare. Carefully controlled flying situations minimize the hazards. Not one single aircraft accident, or a single loss of life, for example, has occurred at the test pilot school during the last two years.

Three Classes A Year

Currently, 48 test pilots a year are graduated from three test pilot classes at Edwards. Many of them stay in their chosen career field indefinitely, while others divert into allied areas. The average test pilot, however, spends six to eight years as a test flyer after graduation from school.

Pilots graduating today will not be doing the same job as their predecessors. Test pilot needs are changing and today's test pilot school graduate will more likely wind up flying helicopters, VTOL (vertical take-off and landing) aircraft, STOL (short-take-off and landing) aircraft than supersonic aircraft. This is because the requirement for pilots to test new jet fighters, fighter-bombers, and bombers is slightly diminishing.

But this doesn't mean test-pilot work is becoming less important. The contrary is true. Such were the thoughts of Brig. Gen. John W. Carpenter III, the Air Force Flight Test Center Commander, when he spoke to a recent class of test pilot school graduates.

"Test pilots have successfully attacked the sound barrier and the thermal thicket. The first man into space will be a test pilot. So will the first man on the moon and the first man to challenge the speed of the light barrier in a race to the stars.

"Each flight flown is another link in the chain of aviation progress that began at Kitty Hawk in 1903. Test flying will not end as long as time continues."

In the Name of Congress No. 19 IN A SERIES

"BIG WEEK" KICKOFF

by SMSgt. Hal Bamford

Bombing during the early weeks of 1944 was sporadic because of uncooperative weather but, in mid-February, European skies cleared and the green light flashed.

FEBRUARY 20, 1944 was a red-letter day in American World War II bombing efforts in the ETO.

After several weeks of marginal weather, the fliers rolled out of bed in the pre-dawn hours, were briefed, and launched the largest raid against the Continent up to that time.

Sixteen heavy-bomber combat wings, numbering more than 1,000 planes, were dispatched and 941 were credited with sorties. In addition, 17 U. S. fighter-escort groups and 16 RAF squadrons flew as cover for the strike against 12 separate targets, half of which lay in the Brunswick-Leipzig area.

Before the day ended, a fourth of all German fighter-production facilities was destroyed, the German Air Force lost 126 fighters in furious aerial combat, and three American fliers earned this Nation's highest award—the Medal of Honor.[1]

Backgrounds of the three men who distinguished themselves as close partners in aerial warfare were amazingly divergent.

First, there was Sgt. Archibald Mathies, third Air Force enlisted man ever to earn the MOH. He was born at Stonehouse, Lanarkshire, Scotland, June 3, 1918. While he was still a small child the family moved to Pennsylvania where his father, William, worked in the coal mines.

In 1938, Archie graduated from Monongahela City

[1] This triple award of the Medal of Honor marked the second highest number ever presented for a single mission, topped only by the five for the August 1, 1943 raid on Ploesti (See, *Priority Target*, Oct. '59). Additionally, the awards to Mathies and Truemper were only the third such "side-by-side" awards for co-crew members. (See, *Reconnaissance Mission*, Aug. '59, and *Priority Target*.)

High School and, in December 1940, enlisted in the Air Force. He soon distinguished himself in engineering and gunnery and became a sergeant.

Yet, nearly three years were to pass before Sergeant Mathies' path crossed that of the first of the two men with whom he was to gain fame. In September 1943, he joined a B-17 combat crew of the 510th Bomb Squadron, 351st Bomb Group at Alexandria, La.

The navigator on the *Mizpah,* as their B-17 was named, was Lt. Walter E. Truemper, a native of Aurora, Ill. The eighth of ten children, Wallie was born on October 31, 1918. As a youth, he gained fame at Aurora's East High School as an outstanding first baseman and a golfer who consistently shot in the low 70s.

After high school, Walter Truemper went on to Northwestern University, but in July 1942, answered his Nation's call to duty. He soon transferred from the Infantry into navigational training and in August 1943, received his wings and commission.

Despite destiny's selection of a common date on which three men would gain immortal fame, Truemper and Mathies were never to meet the third man of the trio.

In the same month in which the paths of Truemper and Mathies crossed, Lt. William R. Lawley, Jr., began combat crew training. Just a few months earlier, in April, he had earned his commission and wings.

Lawley was born in Leeds, Ala., a scant 10 miles east of Birmingham, and entered the Air Force from the latter city.

In November 1943, he joined the 264th Bomb Squadron of the 305th Bomb Group, in England, as a B-17 pilot and almost immediately went into action. By the time the *Mizpah* arrived in England on December 16, Lieutenant Lawley was already on the road to becoming a veteran of the ETO aerial war.

These three men were among the hundreds of combat crew men who flew the mission of February 20, 1944. By this time, Lieutenant Lawley had nine missions behind him. On the other hand, the crew of the *Mizpah* had been over the Continent only twice—once, on February 6, to Dijon, France, and a few days later, to Frankfurt, Germany. These missions had resulted in no more than "shakedown" cruises for the crew. February 20 was to mark its first major combat.

Their assigned target was Leipzig. A scant 15 minutes out they were jumped by two ME-109s, whose initial pass was made almost head on. The results were disastrous.

At least one and possibly two cannon shells entered the cockpit and exploded in the faces of the pilot and copilot. The plane immediately fell off on its right wing and dropped from the protection of the formation.

FO Ronald Bartley, the copilot, died instantly. The pilot, Lt. Clarence Nelson, though unconscious, was still alive when other crew members finally managed to fight their way into the cockpit of the aircraft.

Together, Truemper and Sgt. Carl Moore, the top-turret gunner, managed to get the pilot out of his seat and right the aircraft. With the windshield gone and subzero wind blasting into the compartment, the aircraft was turned and headed for England as the bombardier jettisoned the unused bomb load.

The next few hours were torturous. The three neopilots, Lieutenant Truemper and Sergeants Mathies and Moore, spelled each other in the open cockpit as they nursed the wounded *Fortress* back toward England.

Over the Channel, they finally got the dead copilot out of his seat and, letting down into somewhat warmer air, Sergeant Mathies took the controls and stayed there as they limped for safety.

Soon they were able to contact a control tower, explain their situation, and ask directions to their home station. Lieutenant Truemper had assumed command now and ordered all members of the crew who were able to do so to bail out as they arrived over their home base. With only himself, Mathies, and the dead and wounded remaining aboard, he now detailed his predicament to the tower.

Immediately, the group commander, Col. Eugene Romig, took off in a second *Fortress* in an attempt to aid the two struggling crewmen. He dropped into a wing position with the crippled *Mizpah* to try to guide the pair in their landing effort—a feat neither crewman had ever attempted before. After circling for a few minutes, Colonel Romig finally decided the crippled ship could never make the landing. In addition to

Sergeant Mathies

Lieutenant Truemper

Lieutenant Lawley. Today he is a colonel attending the War College at Maxwell AFB, Ala.

the inexperience of the crew, the controls were so badly damaged he felt they could not be relied upon.

The colonel called the *Mizpah* and advised the two unwounded crew members to point the airplane out to sea and bail out. Truemper and Mathies held a brief consultation, then quietly returned the call.

"Sir, if that's an order, okay, but we'd rather try to bring her in. The pilot's still breathing." Colonel Romig reluctantly conceded.

Twice the giant B-17 turned onto final. Each time her erratic flight caused the crewmen to pull off. As she pulled up for the second time, the controls seemed to go out completely and the aircraft smashed into the woods bordering the field and exploded.

The following June, General Order 52 carried citations awarding USAF's 26th and 27th Medals of Honor to these two gallant airmen who gave their lives in an attempt to save a wounded companion.

Meanwhile, despite the fact that only 21 bombers were to fall victim to enemy action, the mission was proving to be no "milk run" for any of the participants.

Even members of the veteran 305th, some of whom had been in combat for nearly a year, were stunned at the ferocity of the defending German pilots. Among these was the nine-mission veteran, Lieutenant Lawley.

After completing his ninth, a few days earlier, Lt. William Lawley had been granted a 48-hour pass to London. During his absence, his aircraft was flown on a strike by another crew. The lieutenant returned to find the ship had gone down on this mission.

Now, he and his crew were the proud "owners" of a shiny new *Fortress* and were riding it into combat for the first and last time. Although it carried its crew back to England, the plane was so badly battered it was relegated to Class 26 and never flown again.

The citation which accompanied Lieutenant Lawley's Medal of Honor, describes the mission graphically. It was contained in General Order 64, dated August 8, 1944, and marked the award of the 28th such medal to a member of the aerial arm.

For conspicuous gallantry and intrepidity in action above and beyond the call of duty, 20 February 1944, while serving as a pilot of a B-17 aircraft on a heavy bombardment mission over enemy-occupied continental Europe. Coming off the target he was attacked by approximately 20 enemy fighters, shot out of formation and his plane severely crippled. Eight crew members were wounded, the copilot was killed by a 20 mm. shell. One engine was on fire, the controls shot away and Lieutenant Lawley seriously and painfully wounded about the face. Forcing the copilot's body off the controls, he brought the plane out of a steep dive, flying with his left hand only. Blood covered the instruments and windshield and visibility was impossible. With a full bomb load the plane was difficult to maneuver and bombs could not be released because the racks were frozen. After the order to bail out had been given, one of the waist gunners informed the pilot that two crew members were so severely wounded that it would be impossible for them to bail out. With the fire in the engine spreading, the danger of an explosion was imminent. Because of the helpless condition of his wounded crew members Lieutenant Lawley elected to remain with the ship and bring them to safety if humanly possible, giving the other crew members the option of bailing out. Enemy fighters again attacked but by using masterful evasive action he managed to lose them. One engine again caught on fire and was extinguished by skillful flying. Lieutenant Lawley remained at his post, refusing first aid until he collapsed from sheer exhaustion caused by loss of blood, shock, and the energy he had expended in keeping control of his plane. He was revived by the bombardier and again took over the controls. Coming over the English coast one engine ran out of gasoline and had to be feathered. Another engine started to burn and continued to do so until a successful crash landing was made on a small fighter base. Through his heroism and exceptional flying skill Lieutenant Lawley rendered outstanding distinguished valorous service to our Nation.

Thus in one of those inexplicable turns of fate Mathies and Truemper faced the same decision as Lawley, under circumstances unusually similar. These men, on the same day in history, returning from the same raid in two separate aircraft, gambled their lives for wounded companions who could not bail out. Had either Mathies or Truemper been pilots, they may have won as Lawley did. But their odds were too great.

Calling Control

Lifting off Malstrom AFB's runway, the orange-nosed tanker banked to its rendezvous heading. Miles and minutes ahead, a B-47 *Stratojet* winged westward, its crew confident that the refueling tanker would be on schedule. It was.

Like most SAC units, the Montana-based 4061st Air Refueling Wing meets its schedules because of a system and organization called Maintenance Control. It goes into action each time a tanker like the KC-97 or KC-135 returns from a mission.

The chain reaction kicks-off as the flight crew steps from the aircraft. Specialists, called a "recovery crew," debrief the aircrew, jotting down every complaint of mechanical difficulty noted during the mission. From these notes, added to the aircraft's maintenance history, maintenance control determines the work the aircraft needs, and if necessary, schedules it for the shop.

Then Job Control moves in, manipulates the personnel, facilities, and supplies to get the bird into the air in time for its next scheduled mission.

It's a round-the-clock operation—a confusing but highly organized procedure of planning and scheduling, possible only because of skilled and dedicated people who know that a late take-off can cost lives.

A maintenance "recovery" crew meets the aircraft.

After debriefing, a consultation on the job to be done.

Maintenance supervisor MSgt. Joseph M. LeBlanc dispatches the right man to do a job. Calls come in from maintenance by telephone and radio.

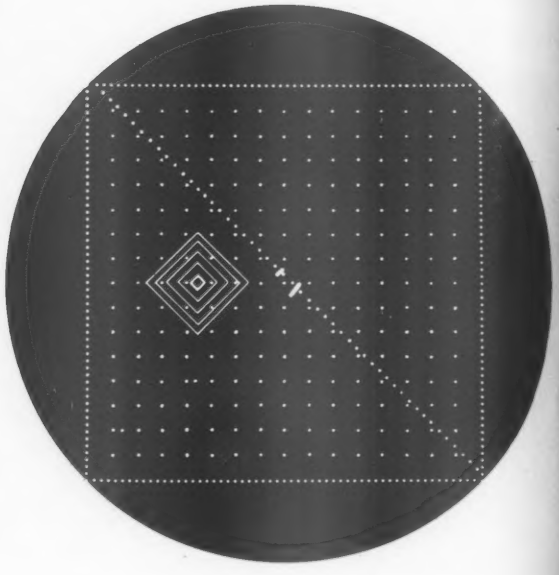
To save time
parts, tools, and men are delivered by radio-controlled trucks.

In the Maintenance Control Center SMSgt. James K. Livingstone assigns men and facilities to the maintenance of the 4061st's aircraft. Sergeant Livingstone can immediately determine the status of every job on the flightline.

In the shop, TSgt. Russell (right) confers with maintenance specialists over a KC-97 engine. Maintenance Control coordinates all maintenance to minimize aircraft ground time.

"She'll fly on time," Livingstone tells maintenance control officer, Maj. Ted Walsh, (right) and Col. Berton Burns, 4061st commander.

There's Security in Circuits



if you can hurdle the academic obstacles of Keesler's wavelength wizards.

by Capt. Ted R. Sturm, USAF (Ret.)

"MAN, this C&E business is the roughest, but I'll cut it if it's the last thing I do." The airman scratched his head, then, with a determined grin, reached for his manual again.

His remark typifies the spirit and determination of the 12,000 students of the 3380th Technical School who are at Keesler AFB for training in communications and electronics. Located in Biloxi, Miss., only a few blocks from where the Gulf of Mexico curves north to form the Mississippi Sound, this Air Training Command base is accurately referred to as the Electronics Center of the Air Force.

Keesler's job is to provide the Air Force with adequate numbers of critically needed operators and maintenance personnel in the communications and electronics career fields. Because of the rapid technological advances being made in the C&E fields and the high loss rate of those exiting after four years, this is a perpetual task. This training is accomplished in seven training departments, one of which is located at Richards-Gebaur AFB near Kansas City, Mo.

Because of large student loads and the high cost of the equipment employed in the laboratory-type instruction many of these departments must operate on a three-shift basis. The academic day is six hours long with classes in operation from 6 a.m. to midnight, Monday through Friday.

The student population is a heterogeneous, cosmopolitan group running the gamut from basic airman to full colonel. In addition to Regular Air Force personnel, there are Air National Guard and Air Force Reserve personnel called to active duty for specific training, Army and Navy personnel, and approximately 250 foreign nationals from 23 allied countries. Almost 20 percent of the training effort is applied to NCO retrainees from practically every surplus career field in the Air Force.

While substantial numbers are trained for Air Traffic Control and the operation of ground and airborne communications and radar systems, most of the students are being trained in the maintenance of radio and radar equipment.

All officers and airmen in maintenance courses follow a common path. They receive a prescribed number of weeks of training in the basic fundamentals of electronics then progress to a "sets" department for training on equipment peculiar to their career field. Course lengths vary from 22 to 51 weeks.

STUDENTS *in the Aircraft Control and Warning Operator course learn scope reading as part of the nine-week course.*

Four Thousand in DEP

"If you can get out of DEP you've almost got it made," you hear Keesler students say. DEP, in this case, is the Department of Electronics Principles which extracts the largest toll in eliminations of the entire school. Yet even DEP's attrition rate isn't bad, considering the complexity of the subject matter.

"You'd expect that we'd have a higher rate than the other departments," Jack Overmeyer, DEP's principle instructor mentioned. "When a man enters electronic principles, he is usually on alien ground. If he gets through our course, he has mastered the fundamental circuits used in the 'sets' departments where he learns electronics equipment."

Student James Ohde, (pronounced O-dee) is an A/3C who agrees with Overmeyer. "I'm not having as big a sweat as some guys," he said, "because I've had two years' college with a major in aeronautical engineering. This gives me the math background a lot of other students lack. Knowing math is really more important than understanding electronics before you start school here."

The school recognizes this fact, and conducts a mathematics refresher course. It's not part of the regular DEP curriculum, so most students who need and want it, take it while awaiting entry into training.

Ohde is on a four-year hitch. At the time he spoke about his background, he was midway through DEP. Basic fundamentals training runs 12 to 19 weeks, depending upon the ultimate equipment the student will study. Ohde was taking the full 19, and was slated for the Aircraft Electronics Navigation Equipment Repairman course.

He is a marked contrast to TSgt. Robert Klotz, a veteran of 17 years' service. Klotz is one of the retrainees the school commander, Col. W. C. Strand talked about when he said, "I've nothing but admiration for the retrainees. Their records are excellent and they overcome more than academic problems."

Klotz spent most of his Air Force life in the weapons release field. He left the service for a while in 1947 and attended business college, but he had no electronics training before he got to Keesler.

"When I saw this retraining deal coming," Klotz said, "I took some ECI courses in mathematics. Now I'm not having too much trouble with the course, but it was rough learning to study again. Sure, I've hit rough spots, but with instructors like Zeke, I'll make it."

"Zeke" is A/1C Joseph Zabukovec who teaches his students, among other things, the characteristics of vacuum tubes. "Zeke" instructs with an enthusiastic informality, spicing dry electronics theory with well-placed humor. "It's simple," he says to his class. "A radar set is like a big puzzle. You learn each piece thoroughly so you know how they all fit together. Then you'll know how to take them apart."

What "Zeke" didn't tell was revealed by Maj. Cecil D. Miller, Director of the Department of Electronics Principles. "Airman Zabukovec and most of the other young instructors spend hours of their own time with students—particularly retrainees—outside classrooms." "Zeke" has a class for only three weeks, because DEP is broken down into six three-week phases, with one phase catching the odd week. Yet he knows most of his students by name.

DEP is the largest department in the school. It has approximately 450 instructors and a student load of about 4,000. Naturally, it is the key to the maintenance courses, for without adequate background in fundamentals, students would be unable to complete the practical training in the "sets" departments. For this reason, the curriculum in DEP is under constant revision. The course was recently revised to include the latest in transistors and printed circuits. Further, with an eye to the future, most of the training material is written for adaptation to television teaching. (See *Venio, Video, Vinco,* THE AIRMAN, August 1959.)

Generalization vs. Specialization

It's easy to think of DEP as a separate course in itself, but actually every student in this department is enrolled in a specific maintenance course. When they complete electronic principles, the students scatter to the "sets" departments to study the particular electronics gear they will use in operational units. But it is not so cut-and-dried that student X can say, "I will study equipment Y." The issue becomes clouded with two training philosophies which explain to commanders: why sometimes ex-students still need much OJT on the equipment they supposedly were trained to know, and why a specialist proficient on one set may be lost if he runs into a modification or another piece of similar equipment.

Generalization and Specialization are the conflicting philosophies. Electronics training at Keesler tends toward generalization; students in the maintenance courses do not specialize on one specific piece of equipment, but receive a broad, more complete background in the principles of all electronics equipment akin to their AFSCs.

Specialization, on the other hand, means a student thoroughly studies one piece of equipment. He works on this in the field. If new gear comes in, he either learns it by OJT or returns to a formal school. There are advantages and disadvantages to both philosophies. Specialization is the obvious answer in wartime when great numbers of men must be trained in a hurry to operate or maintain one type of critical equipment. These men are naturally inflexible; that is, they can be used on their equipment only. If such a man is mal-assigned, he is almost useless. The advantage is that maximum return on the investment is possible for the short time people are in the Air Force during a war.

Generalization is a long-term investment. If there is time, it is better to turn out a man with a stronger background, because he can then adapt to new equipment with a minimum of additional training. This is what is happening now at Keesler.

It has happened before.

As Colonel Strand said, "It's the old pendulum story. If you are around long enough in the military, you'll usually see the pendulum swing back and forth several times. Electronics training—in fact, most technical training in the Air Force—has experienced this. Specialization to generalization and back again, always in tune with highly variable requirements."

Reincarnation

Keesler today is the reincarnation of the original radar school that died at Boca Raton, Fla., in 1947, and the Communications and Electronics School that transferred from Scott AFB, Ill. In mid-September of 1947, a devastating hurricane cut a destructive swathe across the Florida peninsula, wiping out the Air Force's radar school. Within a month, the move to Keesler was under way. In 1949 the Air Traffic Control courses and Radio Operating courses were transferred from Scott AFB, and in 1958 the remainder of the communications and electronics training being conducted at Scott AFB was transferred to Keesler to complete the Electronics Training Center.

The present day school at Keesler includes many civilian employees who have been with the communications and electronics training programs since 1941. To the man, they will tell you that training today—

including instructional methods, housing, classroom facilities, and training aids—is vastly improved over any in the past.

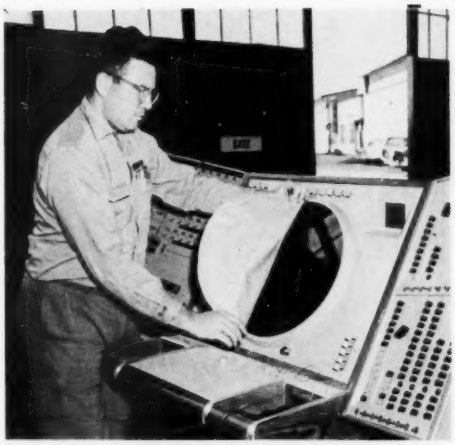
Its quality is evident in instructor and student attitudes. Morale is high, despite the perennial promotion problems among instructor personnel and students know they are getting the best electronics training available anywhere today.

For the basic airman without prior service there is also military training which is comparable in quality and is conducted concurrently with the technical training. The basic airman on his first tour receives five weeks of basic military training at Lackland AFB, Tex., then, having qualified for electronics training, is transferred to Keesler.

When he arrives at Keesler, he is immedately assigned to a squadron housing personnel who are taking the same course he will pursue. He will remain in this squadron until he completes all his training and departs the base. Formerly he would have been assigned to a basic training squadron until he had completed his basic training and then reassigned, but experience has proven that early integration of the basic trainee with more mature, experienced airmen and NCOs is mutually beneficial.

After in-processing, the basic begins technical and military training. He receives six hours of technical training then two hours of basic training each day, Monday through Friday. The basic military training program is the responsibility of the commandant of troops, Maj. Truman F. Anderson, who exercises staff supervision over the 20 school squadrons to which the basic trainees are assigned.

Each basic trainee receives 98 hours of basic training at the rate of 10 hours per week. The program is supervised by Capt. Marvin Karp and SMSgt. Cecil Grant, both of whom are eminently well qualified. Captain Karp has a masters degree in education and Sergeant Grant holds the USAF-wide record for the highest score made in the proficiency test for AFSC 75170—164. Even though the basics are dispersed all over the base, training is conducted centrally with emphasis being placed on good teaching principles and a realistic approach to discipline, i.e., sound personnel management, level-headed leadership, and a complete lack of the "chicken" tactics often prevalent on training bases during World War II.

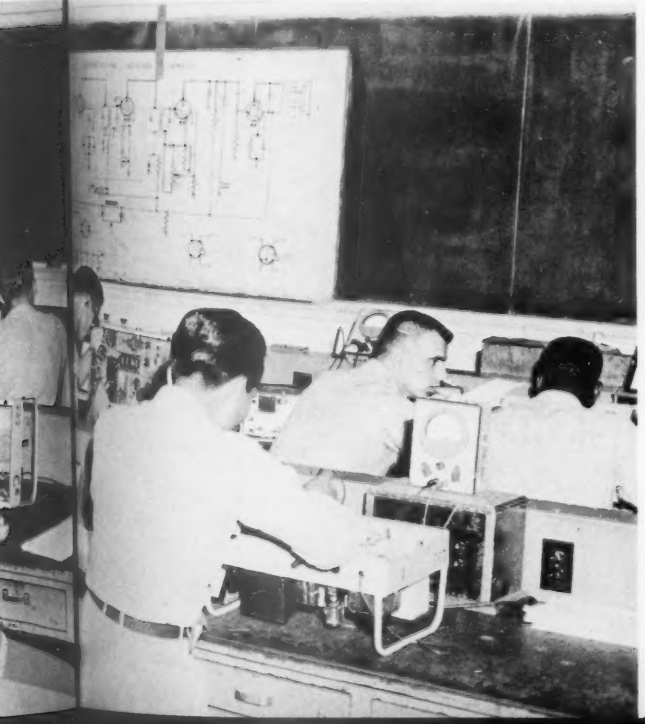


KEESLER'S *ingenious training aids unit fabricates complicated devices to create realism in the training programs. This is a mock-up for SAGE training.*

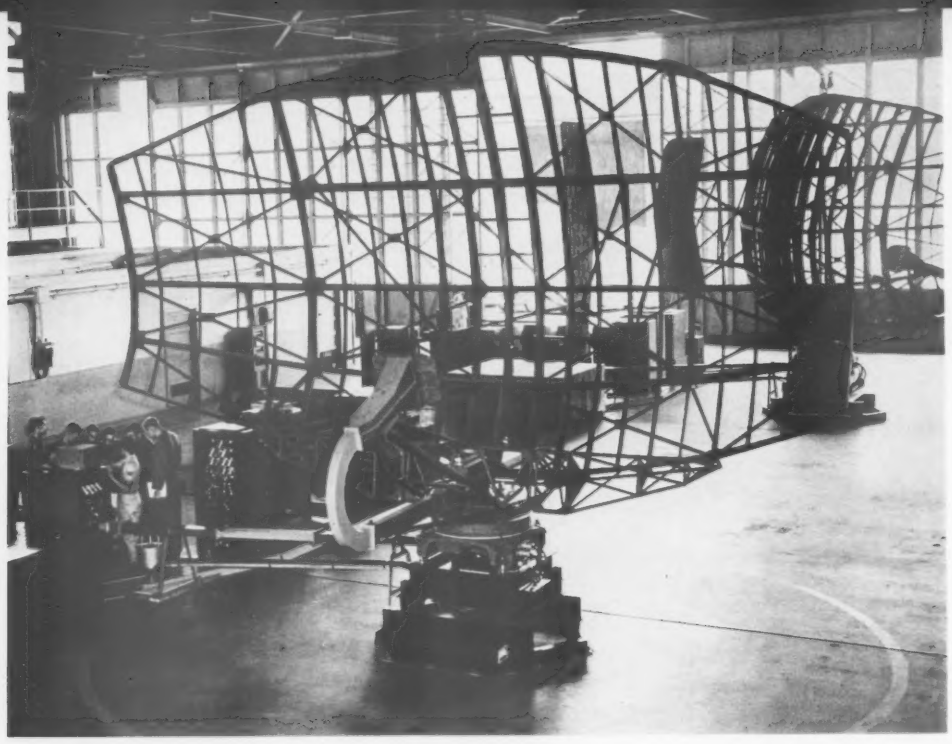
The Officers

Military and academic training for airmen is only half the story. Keesler has a large population of officer students, attending courses in many of the training departments. One department is devoted exclusively to officer training. It is the Officer Communications-Electronics and Missiles Department, (OCE&M) located a few miles from Keesler proper, at the site of the extinct Technical Training Air Force headquarters.

Four hundred officers are enrolled in the course which awards AFSC 3031 at the end of 43 weeks of training. The department also conducts short courses



LAB SESSIONS *allow practical applications of the principles of electronics; give students the opportunity to acquire repair skills and knowledge.*



EQUIPMENT *comes in all sizes. The large antennae are for the FPS-8 long-range radar and are located in hangars for easy student access.*

as may be required, including OCE&M training at the staff officer level (AFSC 3011), some Reserve courses, and a comparatively new ICBM course on the *Atlas* ground guidance system.

A number of officer students at Keesler are ROTC graduates, selected because of engineering or physics backgrounds. Bill Lester, a second lieutenant, is one of them. He is a graduate electrical engineer who hasn't made up his mind about a career in the Air Force. Another is 2d Lt. Margaret M. McConnell who graduated from State University Teachers College in Potsdam, N. Y., with a degree in musical instrument repair. She sees a similarity between her degree and electronics. "Frequencies, harmonics, and the use of hand tools," she explained. She and 1st Lt. Catherine L. Dismuke are in the communications officer school together, the only WAF in the class. Lieutenant Dismuke is a former Naval communications officer and she has a degree in journalism from the University of Georgia. Unlike McConnell, she can't find any points of similarity between her present studies and journalism.

Always Booming

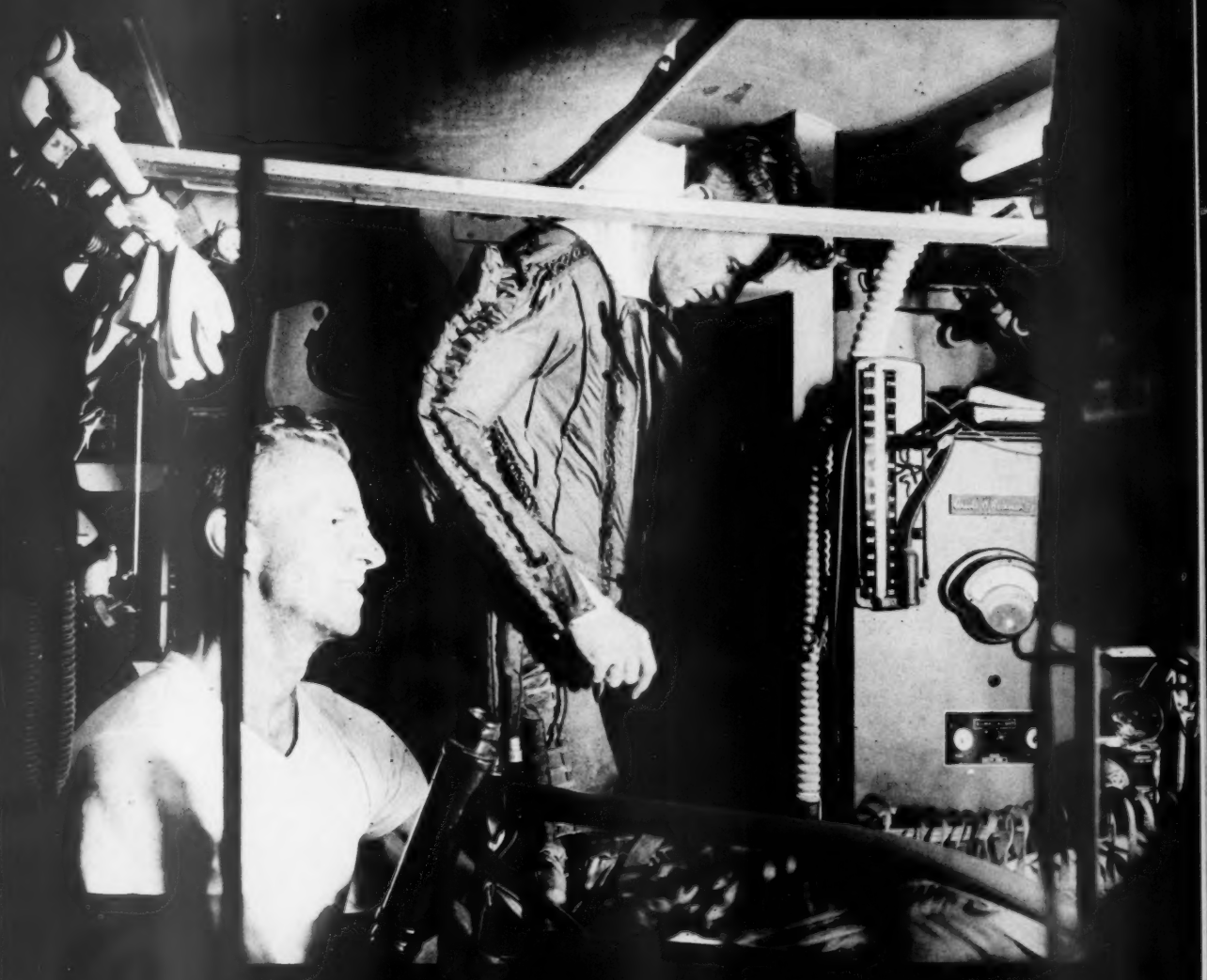
Keesler has seldom known a slack period since its development in 1941. During the war years the base trained airplane mechanics, was a basic training center, and spawned the first air-sea rescue units of the Air Force. At one time its population swelled to 42,000 but now averages about half that amount. The electronics school turns out about 20,000 graduates a year. The base comprises a significant part of the population of Biloxi, which, excluding military personnel, is approximately 50,000. Maj. Gen. John R. Sutherland commands the Technical Training Center, which, besides the School, includes the normal support functions of any base comparable in size. Keesler has an active Family Services Program; something old-timers view with disbelief. TSgt. Paul Diamond spent a lot of time in schools during the war. "Today's training is a far cry from the old days, both in quality and the reception given students and their wives." He is an Air National Guardsman from California, called to active duty for a year to take an AC&W course.

His wife, Ruth, has devoted considerable time and effort to Keesler's Family Service Program and both she and her husband take an active part in base activities. "You feel you belong," she remarked. "Not like it used to be when a student was an outsider."

It is all these things—conscientious instructors, adequate facilities, and quality training, which make Keesler Technical Training Center a vital link in the Air Force scheme of things. It is good that this is so, because the demand for Keesler's product will increase as technology advances. It is important that the training and the base where it is conducted be as attractive as possible so that each student will enthusiastically absorb as much as his capabilities will allow.

After all, you can't go anywhere in the Air Force today without meeting a graduate of Keesler, the Electronics Center of the Air Force.

AIRMAN'S WORLD



As the time for man's first ventures into space draws nearer, increased emphasis is being placed on studies of space travel. USAF's School of Aviation Medicine is one of the agencies conducting these tests. Sealed-pressure chambers are used to check man's reaction to confinement, high humidity, and varying carbon dioxide levels. This shot was made through the porthole of one of the test chambers.

People

WHO MADE NEWS THIS MONTH

Lt. Laurel Statham, a fighter pilot with the 81st Tactical Fighter Wing, RAF Station Bentwaters, England, was so impressed by the men of the organization upon his arrival that he decided to present them with a permanent reminder of his respect. The result is this mural on which he is putting the finishing touches. His dedication of the painting is "to the men who maintain the F-101 *Voodoo* and the pilots who fly it."

FIGHTING to the surface following a helicopter crash in the waters near Eniwetok, Col. Ernest A. Pinson saw a fellow passenger trapped in the partially submerged aircraft. Disregarding his personal safety, he returned to the cabin, freed the other victim, and applied artificial respiration to him atop the crashed plane. Presently assigned as director of the Air Force Cambridge Research Center's Geophysics Research Directorate, the colonel was recently awarded the Soldier's Medal for his heroic actions.

A YEAR AGO, SMSgt. Frank A. Gates noticed an overturned boat at Kamloops Lake, B.C. Plunging into the freezing water, Sergeant Gates towed the boat, with two persons clinging to its side, into shallow water. There he righted it, freeing a third person who was trapped beneath it. For voluntarily risking his own life, Gates, presently assigned to the 25th Air Division, McChord AFB, Wash., was also awarded the Soldier's Medal.

DURING a night mission, Maj. Jack M. Larrabee's KC-97 tanker was severely damaged when it collided in midair with the aircraft it was refueling. Using all his piloting skills, Major Larrabee nursed the crippled plane to his home station and fought it in to a safe landing. As a result, he was recently awarded the Distinquished Flying Cross. The major is presently assigned to the 384th Air Refueling Squadron, Westover AFB, Mass.

OFFICIALS at Pope AFB, N. C., have filed a claim that their base is home to the smallest unit in USAF. The outfit is Flight A, 2315th Air Transport Squadron. The organization boasts one aircraft, a C-47, and four men—Capt. Frederick H. Boyd, Capt. William Raybould, SSgt. Coy D. Widner, and A/1C Patrick J. Davis. Their assignment —special air missions for the United States Army.

ANOTHER "unique" claim has been filed for Naha AB, Okinawa—for the most unusual club anywhere in the USAF. Dubbed the "Island Jesters" or "Naha Ha-Ha's," the clown club was founded by A/1C George Hammar and A/1C David Gasque and boasts a steadily growing membership. They willingly donate their services at orphanages, schools, hospitals, and social functions.

A 67-YEAR-OLD British woman is now able to walk, thanks to the efforts of Capt. William Stanford, a flight surgeon at RAF Station Wethersfield, England. Victim of low blood pressure, the woman was unable to stand without immediately blacking out. Informed of her plight by members of a nearby hospital staff, Captain Stanford arranged for use of a G-suit. By wearing the inflated suit, the patient is now back on her feet and well along the road to recovery.

MAJ. ELIZABETH GUILD recently received a unique distinction when she was "officially" named an "honorary gentleman" by colleagues at the School of Aviation Medicine. During her assignment there, she was the only woman assigned to bio-acoustics research. Since transferred to WADC, at Wright-Patterson AFB, Ohio, Major Guild is continuing her studies into the biological effect of sound on man. In her new assignment, she again bears the distinction of being the only woman audiologist on the project.

Events

THAT REFLECT AIR FORCE PROGRESS

THREE new USAF specialties have been added to the officer career structure, effective February 29. They include electronic computer maintenance officer (3064); logistics staff officer (6316); and ground safety officer (7354).

AS PART of a new retention plan offered by SAC, 21 "DOS" officers from Blytheville AFB, Ark., were recently taken on a tour of command headquarters, briefed in the directorates of plans, operations, and personnel, and conducted through the underground control center.

Completion of a "physical check" of the F-105 in less than a minute is now possible through the use of this Republic Aircraft Corp -developed RADFAC. Use of this unique electronic device allows a complete check of the jet's communication, identification, and navigation systems while the pilot remains in the cockpit. If anything is amiss during the check, RADFAC also aids in pinpointing the trouble.

Believed to be the first of its kind, the tour provided increased understanding of the command's functions and missions. Its purpose was to improve career orientation. The group was composed of nonrated officers such as lawyers, doctors, nurses, and a chaplain.

SAGE and dispersal policies are triggering some of the major moves and unit changes upcoming in NORAD and SAC.

NORAD's 56th Fighter-Interceptor Squadron closed down operations last month at Wright-Patterson AFB, Ohio. Three other of the command's F-104 squadrons will also go out of business later this year. Almost simultaneously, SAC announced the formation of their first B-58 wing, the 43rd, which has moved to Carswell AFB, Tex., from Davis-Monthan AFB, Ariz.

THIS month, the 19th Air Refueling Squadron will complete its move from Homestead AFB, Fla. to Otis AFB, Mass. At the same time, two additional fighter units will be inactivated. The 53rd Fighter Group and the 14th Fighter-Interceptor Squadron at Sioux City AFB, Iowa, will give way to the newly organized SAGE unit in that defense sector.

In May, the 342d Bomb Squadron will shift from Blytheville to Robins AFB, Ga., and the 18th Fighter-Interceptor Squadron from Wurtsmith AFB, Mich., to Grand Forks AFB, N. Dak. Arrival of the 18th will signal the beginning of active flying operations at the North Dakota station.

USAF'S aircraft accident rate dropped to a new all-time low of 8.3 accidents per 100,000 flying hours last year. Total fatalities were sliced nearly in half and midair collisions dropped 16 percent. At the same time, not a single accident occurred involving Air Force and civilian aircraft, a record extending through 19 consecutive months. MATS was singled out for special praise in view of having flown more than 2.4 billion passenger miles without passenger fatality or injury.

HARLINGEN AFB, Tex., hit Air Force headlines last month with the graduation of the ten-thousandth cadet to complete navigation training at that base. The first received his diploma on January 22, 1953; the most recent on March 19.

Briefs

. . . The Military Division of the Cessna Aircraft Co. recently received a $9.5 million contract for the production of several additional T-37B intermediate jet trainers.

. . . Republic's F-105 *Thunderchief* completed the first 10 months of its military career without a single major accident. The period included all flight tests and pilot checkouts conducted by USAF.

. . . The first production model GAM-77 *Hound Dog* air-to-surface missile was recently accepted for delivery at Downey, Calif. Gen. Thomas S. Power, SAC Commander in Chief, was the ranking Air Force representative at the ceremonies.

. . . The AiResearch Manufacturing Center of the Garrett Corp. will supply new air conditioning and air data systems for the improved Lockheed F-104G *Starfighters*.

. . . USAF has asked for new bids from contractors interested in operating the basic flying school at Vance AFB, Okla. Studies have proven that such operations foster considerable military manpower savings.

. . . USAF Secretary Dudley Sharp has directed the transfer of a number of Boeing C-97 *Stratocruisers* to Air National Guard units. First to be supplied will be the 109th at Minneapolis, Minn., and the 115th and 195th at Van Nuys, Calif.

Aerospace Library

In the world of the air, the adage that truth is stranger than fiction is startlingly illustrated by two excellent offerings this month.

Kenneth Simmons was forced to bail out over Germany late in 1944 after a raid on Mainz. In the months that followed, he was among the prisoners of war that populated the Axis camps. In ***Kriegie,*** Simmons recreates those months with sincere realism. Thomas Nelson and Sons, $3.95.

A fitting companion piece is Dutton's ***Twenty Seconds to Live,*** by Elizabeth Land. It features the thrilling, true tale of Lt. James Obenauf and his struggle with a crippled B-47.

This pair is supplemented by several fine fictional works. Among these is ***The Edge of Things,*** by William E. Barrett, containing two novels and two novelettes, which explores the strange borderline between reality and the supernatural in the air. Doubleday and Co., $3.95.

Other current fiction includes ***Flight from Ashiya*** by Elliott Arnold, ***Shoulder the Sky*** by George Leonard, and ***The War Lover*** by John Hersey, the latter a Book-of-the-Month Club selection. ***Shoulder the Sky*** was published by McDowell, Oblensky; the others by Knopf. Respectively, they are priced at $3.95, $4.50, and $5.00.

There are also two important contributions in the field of photojournalism. ***The Missilemen*** by Mel Hunter relates the saga of the men behind the newsmaking rocket launchings of the still-new space age. Doubleday, $4.95. Equally important is ***The Aircraft Yearbook,*** edited by James J. Haggerty, Jr. This official publication of the Aerospace Industries Association covers both civil and military aviation. American Aviation, $6.00.

In the field of technical publications, Philosophical Library has contributed ***Radiation Counters and Detectors*** by C. C. H. Washtell. Designed as an introduction to counting devices, it provides an easy but broad understanding of the basic principles and general background of the subject. Price, $7.50.

In the same general category is ***Space Handbook: Astronautics and Its Applications*** by Robert Bucheim and the staff of the Rand Corporation. Priced at $3.95, the book is built around a report on space technology originally prepared for the House Committee on Astronautics and Space Exploration.

You Ask It

Q. Can Air Force members attend professional conventions and similar meetings in temporary duty status?

A. Yes. See AFR 30-23, dated 24 September 1957.

Q. I intend to apply for retirement in a few months. May I have my GI insurance premiums deducted from my retirement pay?

A. Yes.

Q. Who writes the Airmen Proficiency Tests used in the Air Force?

A. Senior NCOs qualified in the specialties concerned. Every effort is made to get the most experienced personnel from each command when a new test or revision is scheduled.

Q. Speaking of these revisions, how often are the APTs reviewed and brought up to date?

A. Each APT is revised approximately every two years.

Q. I am a widow of a WW II veteran. My son will enter college this fall and we would like to apply for War Orphan schooling. Who should make the application?

A. If the student is under legal age, the parent or guardian must apply for him. If he is of age, and has no known disability, he may apply.

Q. Recently I obtained a loan on my GI insurance and because of an emergency, I am having problems meeting the interest payments. Does the VA grant a grace period?

A. No. Interest on money borrowed with GI insurance offered as security is due on the loan anniversary date. If it is not paid at that time, it must be added to the total amount of the loan.

Q. I recently heard rumors of an instance in which a man was denied retirement pay because of a court martial conviction. Is this possible?

A. It certainly is. Upon retirement, each individual is required to complete a questionnaire which includes a section regarding court martial convictions. This is reviewed by the Judge Advocate General and a decision on future payments is made by that office. The nature of the offense is usually the determining factor.

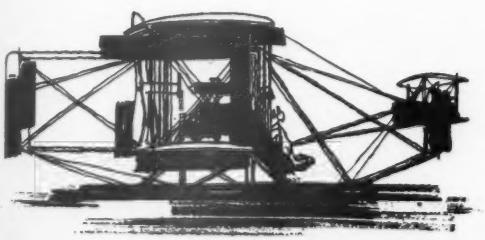
Q. What is the deadline for Korean GI loans?

A. The loan deadline for Korean veterans is January 31, 1965.

THE THUNDERBIRDS, *official USAF aerial demonstration team, recently completed a tour of the Far East. Included in their stops was Clark AB, P.I. Here the group met a band of warriors who provided an opportunity for this study in contrast of ancient and modern weapon systems. The four Negrito warriors clambering over one of the North American F-100* Super Sabres *are from a village near Clark AB.*

JET AGE *dunce cap? No, just a Republic Aircraft Corp. employee inspecting the interior of the forward radar nose-cone of the "smart" new F-105. D-models of USAF's latest all-weather fighter-bomber will soon join the operational inventory.*

Panorama



Our Air-Minded Ancestors

The example of the bird does not prove that man can fly. Imagine the proud possessor of the aeroplane darting through the air at a speed of several hundred feet per second. It is the speed alone that sustains him. How is he ever going to stop?

Simon Newcomb (American astronomer)
October 22, 1903

Only a few weeks later, Wilbur and Orville Wright accomplished the first officially recognized heavier-than-air flight at Kittyhawk, N. C., on December 17, 1903.

Boffs in Blue

Despite continuing improvement, housing can still be a problem in Air Force living—especially when an unwanted outsider takes a hand.

That's the problem facing officials at Laughlin AFB, Tex. Sometime during final construction stages of the Capehart project at that base, a polecat chose one of the attractive new units as its own.

Since then, it has forced two sergeants and their families to evacuate the new quarters. Now, final battle lines have been drawn, a project officer appointed, and "Project Stinky" is in full swing. Object—to reaffirm RHIP. After all, everyone knows this two-striper doesn't have enough time in grade to rate such quarters.

One minute it was a routine flight. The next, a fight for survival. As they tumbled head over heels in the storm, the majors finally knew what it was like to eject.

BAILOUT!

by L. B. Holmes, *Eglin AFB, Fla.*

ALONE T-33 jet trainer enroute to Montgomery, Ala., leveled off at 27,000 feet over Crestview, Fla. A severe winter storm, marked by widespread rain, low ceilings and visibility, and considerable turbulence raged over Northwest Florida. It was December 17, 1959.

In the front seat, Maj. Alton D. Slay, commander of the 4751st Air Defense Squadron (Missile) made a visual check of the instrument panel. Everything checked OK; R.P.M. 100 percent, tailpipe temperature normal, on course, on altitude. Behind him, his operations officer, Maj. Robert Taylor, checked the flight plan and made a position report to the New Orleans Flight Center:

". . . Crestview 1514—27,000 feet—IFR clearance —estimating Montgomery at '28." It was the last position report. Minutes later the jet's engine flamed-out.

In a split-second Slay pulled off the throttle. His voice was crisp but calm.

"Flameout, Bob, trying for an air start."

Before Bob Taylor could answer "Roger," Slay had set up the switches for emergency air start procedure. The attempt failed.

Neither man had faced this type of emergency before, but their reactions were instinctive. Training and drill assured that.

"We'll try again, Bob." No luck. "Let's clear this bird at 15,000 feet if she won't kick in."

Taylor conveyed his concurrence with a short "Right" and keyed the mike. "Mayday," he transmitted, "Flameout, Air Force jet . . ." The battery went dead. Another restart try. No go.

At 15,000 feet Al Slay snapped up the armrest that blew the canopy. Taylor watched the wind buffet Al's head about as if it were a rag doll's. It occurred to him that his was doing the same. But now it was time . . . parachute straps tight, feet in the seat stirrups, helmet disconnected from the communications system. Two seconds after the canopy blew, Bob Taylor squeezed the trigger that thrust him into space. In more than 3,900 hours of flying this was his first bailout. He always wondered how it felt. As he rolled head over heels into space, he knew.

Meanwhile Al Slay had trimmed the aircraft to fall close by. Having flown this corridor numerous times, he was certain they were over a forest. He "cleaned up" the cockpit, detached himself from the intercom system, tested his bailout bottle of oxygen, found it didn't work, ripped off his oxygen mask, and pulled down his visor. He'd been in touch-and-go spots many times during his 5,000 flying hours but this was no less a moment of truth. Seconds after Bob had ejected, Al pressed the lever and shot out of the cockpit. Like Taylor, he felt himself tossed like a cork on an angry sea, tumbling end-over-end. Then he released his safety belt and pushed the seat away. It floated off to its limbo. A sudden jarring brought him up short and he looked up to see his big, beautiful chute above him.

From the corner of his eye, he spotted Bob floating downward within yelling distance.

"Are you OK?" Slay shouted. "Yeah Al, how're you doing?" Nodding, he made Bob understand he was fine. He noticed that Bob's helmet was gone, and although wiping blood from his head, he was smiling.

They had bailed out on the edge of a thunderstorm and the turbulence was tossing them about like puppets on strings. In the small, thick snowflakes, he soon lost sight of Bob. Suddenly Al emerged from the turbulence to another layer of clouds and as he peered toward the earth, it seemed as though he were looking down a monstrous, dark funnel to infinity. It looked like a Walt Disney fantasy as he swirled around and sideways

and down, down, down with the snowflakes adding a touch of eerie incredibility to the surrealistic nightmare.

Al's chute started to oscillate dangerously. He swung from side to side, his chute collapsing as he reached the upside of the swing, then dropping him what seemed to be several hundred feet. He felt as though he were on a roller coaster—a thrill he would have preferred to forego. He pulled on the risers to stop the oscillation and found, instead, he was aggravating it. He surged downward at accelerated speed. Time lost all meaning as his chute kept up its little game. His attempts to control it were futile. After what seemed like an eternity, Al broke through the clouds at about 800 feet—terra firma never looked so good. He tried to determine the oscillations so he would land on the forward swing. There again the training triggered his thoughts from the distant past.

A man falling backward in a chute can break a leg or a spine, he recalled. *I've got a much better chance of not hurting myself by falling forward and tumbling.* He must have been living right—he came to a sudden stop, his feet dangling a scant 12 inches from the ground. That oscillating, life-saving chute was caught between two pine trees, rocking him back and forth like a child on a swing.

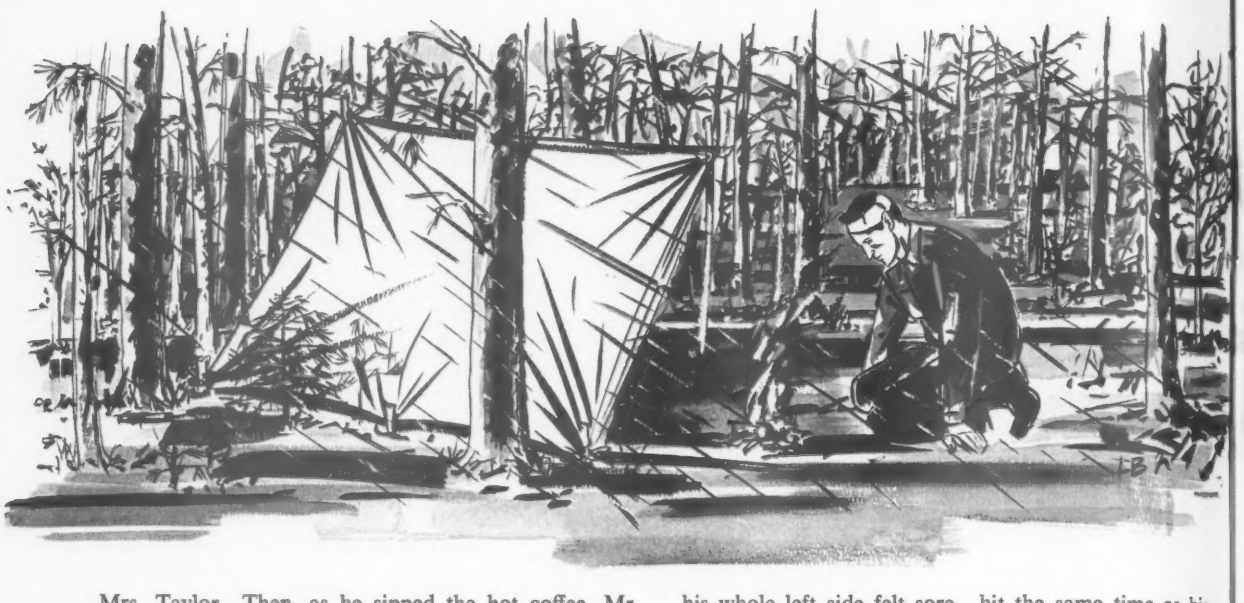
Letting himself out of the harness, he saw that he was in the middle of a forest. A steady downpour beat on him mercilessly. He rushed out to a clearing, looked and yelled for Bob but only echoes answered. He trudged through the underbrush to a logging trail a few feet away and started to search for Bob in a systematic way, covering the whole area southeast of his own landing. It was getting dark. "Bob must be seriously hurt and unable to move. I've got to get out of here and get help." There was no one to answer him.

He set out on the logging trail, bending pine twigs to indicate his path. As he slipped and slid through the mud, he thought of his wife and son who must have been told of the flameout by now. They would have been told of the excellent chance for survival from the T-Bird. So would Bob's wife and family. Although both women knew their husbands could take care of themselves, the sooner he got word to them, the fewer their hours of anxiety.

Al's feet were throbbing, obeying his brain's command to move forward, one after the other. For 12 miles he plodded through the slippery mud until he finally saw a farmhouse light in the distance and rushed forward as fast as his mud-caked boots allowed.

Leslie Black, farm-owner, opened the door after insistent knocking. He stood there staring at what appeared to be a being from another planet. Saturated to the skin, blood from his cut chin smeared over his face and flying suit, Al Slay looked like a spectre. As he blurted his story, Mrs. Black and their two daughters, clad in pajamas and robes, rushed to the door.

They urged Al to come in, but he first tried to remove his mud-covered boots. It took an assist from Mr. Black and a prolonged tug-o-war before they came off his swollen, aching feet. As the aroma of fresh coffee drifted from the kitchen Al called the base, his wife and



Mrs. Taylor. Then, as he sipped the hot coffee, Mr. Black took over the phone. In minutes neighbors arrived and as Al climbed into Mr. Black's pickup to begin the hunt for Bob, he noticed about 200 people had accumulated to aid in the search effort. The newly formed Civil Air Patrol unit organized the search party and they soon got under way. Al couldn't shake the feeling that his friend was hurt and in trouble.

His worries about Bob Taylor were unfounded. While the search party was being organized, Bob was living it up in a neatly built lean-to. In the few seconds after he separated from his seat he felt a pounding on the side of his head, shoulder and wrist. Something had hit him. A jolt told him his parachute opened but as he looked up, he could see nothing. He pushed something away from his face. It was his helmet which saved his head from a more severe blow from whatever it was that hit him. He pushed it off, and the sudden impact of cold air and snow hit his face and felt good. His head cleared. It was then that he saw Slay.

His chute behaved well except for the rain that gushed down every one of the 32 risers onto his upper body to saturate him. He emerged from the clouds and spotted the ground, but had to make some body turns to land properly. Bob pressed his legs together tight, and made a perfect standup landing. The gusty winds deposited him about a mile and a half north of Al.

The first thing Bob did was pull out his squadron cap from a side pocket of his flying suit. He tried to put it on but it wouldn't fit. The ostrich egg on the side of his head saw to that. Bob sat down and reached into one of his pockets for his survival kit. He never flew anywhere, even in the C-47 without it. He opened it carefully, trying to keep the rain out, broke open an ammonia capsule, and breathed it deeply to clear his head. He took out a compress, put some iodine on it, placed it on his head, tied it on securely and sat back to think what to do next. As his head cleared, he gathered in his chute. His left hand was almost useless; his whole left side felt sore—hit the same time as his head, he surmised.

Chute under his arm, he started to walk in the direction he figured would take him to Slay. The chute was heavy and cumbersome and caught on everything. He felt woozy and weak. *Stop, Bob. Think. You've been a camper and a woodsman all your life to say nothing of the two Air Force survival schools you've gone through. You're better off staying put until you feel better or until they find you.*

He retraced his steps to a good camping spot, rounded up his gear, cut his parachute in half, and made a lean-to. Training that he thought he had long forgotten guided his action. He dug out the underside of fallen trees with his knife, figuring the dry rotted wood would burn readily. He hoarded the mounds carefully and rushed back to his lean-to to start a fire. His strike-anywhere matches did the job. The fire flickered, then hungrily flared. He tore off a square of his parachute, filled it with pine cones, twigs and dry rot, working slowly, methodically, resting whenever he felt dizzy. As his fire built up and the heat warmed his lean-to he stripped off his clothes and dried them on the clothesline he had strung up.

In the distance he heard a Diesel train. "If I'm not found tonight," he thought, "I can walk out at dawn." He sat on his inflated Mae West life preserver and felt quite cozy. Near midnight the moon came out and the rain ceased. He thought of his wife, Kay, and their son and daughter. They knew he could take care of himself—if only they could know he bailed out—someone must have heard his last MAYDAY.

Suddenly he heard voices, then a tractor. He yelled, "Air Force! Bailed out!"

Answering voices called "We got you!" In minutes members of the Civil Air Patrol descended upon him. He called out, "Come over and warm yourselves by the fire!"

He felt rather proud of that fire.

Longevity Claim

Sir: First, let me congratulate the staff members of THE AIRMAN for their excellent publication, especially the historical articles which have been appearing in recent months. I know the research which goes into such a task as I am an historian myself. I noticed in *Flight Into Danger*, by Sergeant Craven in the December issue, a mention of the March Field *Fly Leaf*. This paper was first printed on July 6, 1918, and is still in publication although now appearing under the banner of *The Beacon*. We at March feel our paper is probably the oldest in the USAF. Do you know of any which predate it?

MSgt. Bob Boyles
March AFB, Calif.

● *Members of* THE AIRMAN *staff have no knowledge of an older Air Force publication. Any readers aware of one which tops this for longevity?*

★ ★ ★

Test Force

Sir: After reading your interesting article about the B-58 *Test Force* in the December issue, I felt I should write and express my gratitude for the credit you gave the members of this team. I was stationed here during the period when this team was testing the *Hustler*, had many opportunities to observe these men in action, and grew to repect them to the highest degree.

A/3C Byron Robinson
Carswell AFB, Tex.

★ ★ ★

Insurance

Sir: As a civilian employee of the Air Force, I manage to get a look at your excellent magazine once in awhile. I have been impressed by some of the advice given to your readers in the *Letters to the Editor* and *You Ask It* columns and now would like to pose a question of my own. I have a GI term insurance policy in force, and I would like to continue it for the rest of my life. However, I have often heard the rumor that eventually unconverted insurance will be canceled. Is there any basis for this rumor?

George Clark
Madison, Wisc.

● *Officials at the Veterans' Administration headquarters in Washington are quite emphatic in stating there is no change contemplated which would lead to cancellation of term insurance policies. However, they also note, that premiums on such insurance increase every five years. There is no premium increase in permanent plan policies.*

★ ★ ★

Isolated Tours

Sir: I have just completed the article *Somebody's Gotta Go There* which appeared in the October issue. It includes a statement that "there can be no guarantee that everyone will be happy with his assignment, but everyone gets a 'fair shake.'" I have completed a total of four isolated tours and am forecast for a fifth in the near future. I hardly call this a "fair shake."

TSgt. Colon Gardner
Charleston AFB, S. C.

Sir: I would like to take exception to the "fair shake" statement in the article *Somebody's Gotta Go There*. I have served consecutive isolated tours and several other people who possess AFSCs in my career field have also wound up repeatedly in "Windswept Junction," despite the lofty assurances contained in this article.

TSgt. Leroy Miller
APO 130, New York, N. Y.

● *Officials in the Warrant Officer and Airmen Assignment Division indicate that there are a number of AFSCs within the Air Force for which there is no requirement in the more "desirable" locations. Consequently, when assignments are limited in such a manner, all personnel falling within these categories are grouped for separate selection with their contemporaries. Within these groupings, the same effort is made to provide a "fair shake" for all those affected. Normally, this means staggering of 12- and 18-month tours instead of the standard rotation between so-called isolated and desirable duty assignments which are limited to men with universally usable AFSCs.*

★ ★ ★

Wewak Attack

Sir: I have just completed the November installment of your *In The Name of Congress* series and enjoyed it as usual. As a former member of the 3rd Bomb Group which also participated in that raid, I would like to add an interesting sidelight to Sergeant Bamford's article. Prior to the attack on Wewak, B-25 strafers, because of their limited range, had never been able to reach this enemy stronghold. The Japanese knew this and became careless about dispersing their aircraft. We solved the range problem by removing the lower turret and suspending a 300-gallon droppable gasoline tank from bomb shackles. As a result, the sweep caught the enemy completely unprepared and resultant damage was of major proportions.

MSgt. Edward Haynes
APO 994, San Francisco, Calif.

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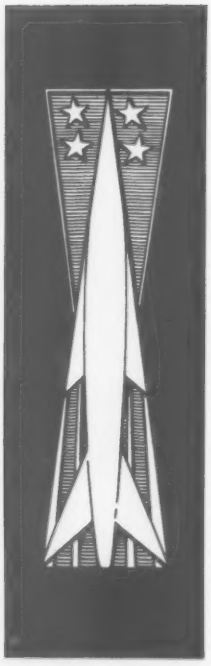
by
MSgt. Paul J. Turner
Airman Staff



MORE AND MORE AIRMEN are becoming missileers . . . a relatively new Air Force breed. Theirs is a peculiar lot, marked by the normal monotony of remote duty sites and devoid of the usual sense of accomplishment of seeing their "bird" return home, "mission accomplished."

Yet the vital role these men play in supporting the Nation's guided missile capability provides its own sense of reward, enhanced by the Mark of Missileers—a distinctive sterling-silver and blue badge worn on the left breast pocket of their uniforms.

To maintain prestige for the Guided Missile Insignia, the Air Force recently revamped AFR 35-5, the directive establishing the criteria for award of the insignia. New guidelines, mainly restrictive in nature, limit award of the badge to individuals *directly* engaged in missile work. The new regulation eliminates many of the "growing pains" suffered because of the rapidly expanding missileer program.

Groundwork for the missile insignia was laid in '57 and early '58. The first badge was awarded in July 1958 and the following March, the original AFR 35-5 was replaced. Although guidelines were established, numerous changes and multiplying "grey areas" often caused misinterpretation of the directive and loose application of its requirements—so loose that some major air commands suspended awards until Hq, USAF could redefine award qualifications.

Meeting of Minds

Last October Hq, USAF personnel met with representatives of the major air commands concerned (SAC, TAC, ADC, ARDC, AMC, ATC). The latest revision is a result of this conference. Most knotty problem resolved was that of which airmen are to be eligible for the insignia. In some cases guided missile AFSCs and direct missile launching duties made selection easy, but many "grey" areas of missile support had to be disqualified by a process of elimination. Thus, the new directive lists the AFSCs which render their holders ineligible for the badge, unless waivers on an individual basis are granted by Hq, USAF or the major air command—which incidentally cannot delegate this waiver authority. Career fields on the ineligible list are:

001X	25	67	77
002X	55	68	78
005X	56	70	79
006X	57	71	82
14	58	72	85
20	59	73	87
22	62	74	90
23	64	76	99

eMissileers

Limitations of this paragraph appear several times in the regulation, emphasizing the importance USAF places on reserving the insignia for those individuals *directly* supporting missile activities.

From the positive standpoint, the regulation defines eligible individuals as those who: (1) possess a guided missile AFSC, (2) are assigned to a missile unit with a direct and distinctive role in the command, operation, or maintenance of the missile and/or its related ground support equipment or (3) possess a missile AFSC and are assigned to a staff position with primary duty associated with guided missiles. Further, eligible airmen must demonstrate satisfactory performance in an appropriate duty position for at least six months prior to the award. This time element was formerly three months.

Airmen must also have attained the 5-level skill in their AFSCs. In those rare cases where only 3- and 7-levels are used, the 3-level is to be considered a 5-level for eligibility purposes.

Command Decision

Command and staff positions were also a source of considerable trouble during implementation of the earlier regulation. The new directive requires major air commands to identify their staff positions directly associated with guided missiles. Within Hq, USAF, each deputy chief of staff or equivalent will review his positions and determine those eligible for the badge. DCS/Personnel is the approving authority on all recommendations in the air staff.

Award of the missile insignia is made on special orders which may be published by units designated by the major air command (except as limited by the restricted AFSC listings). Once the award is made it is held permanently by the individual unless he is prohibited from wearing it because of failure to perform his assigned missile duties satisfactorily or because of conduct which might bring discredit to the insignia. Such revocation of missile awards will also appear on special orders.

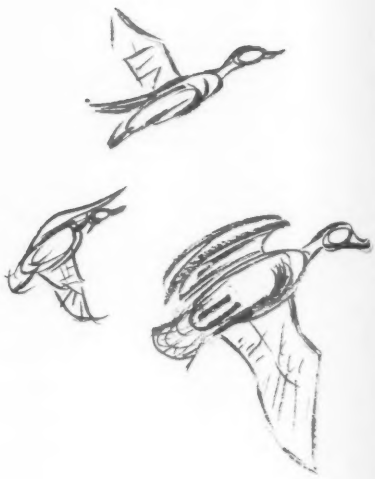
A Select Few

The missile insignia itself depicts a missile rising vertically to penetrate a cluster of four stars. The stars are indicative of both the aerospace role assigned to the Air Force and traditional stars and stripes associated with our democracy.

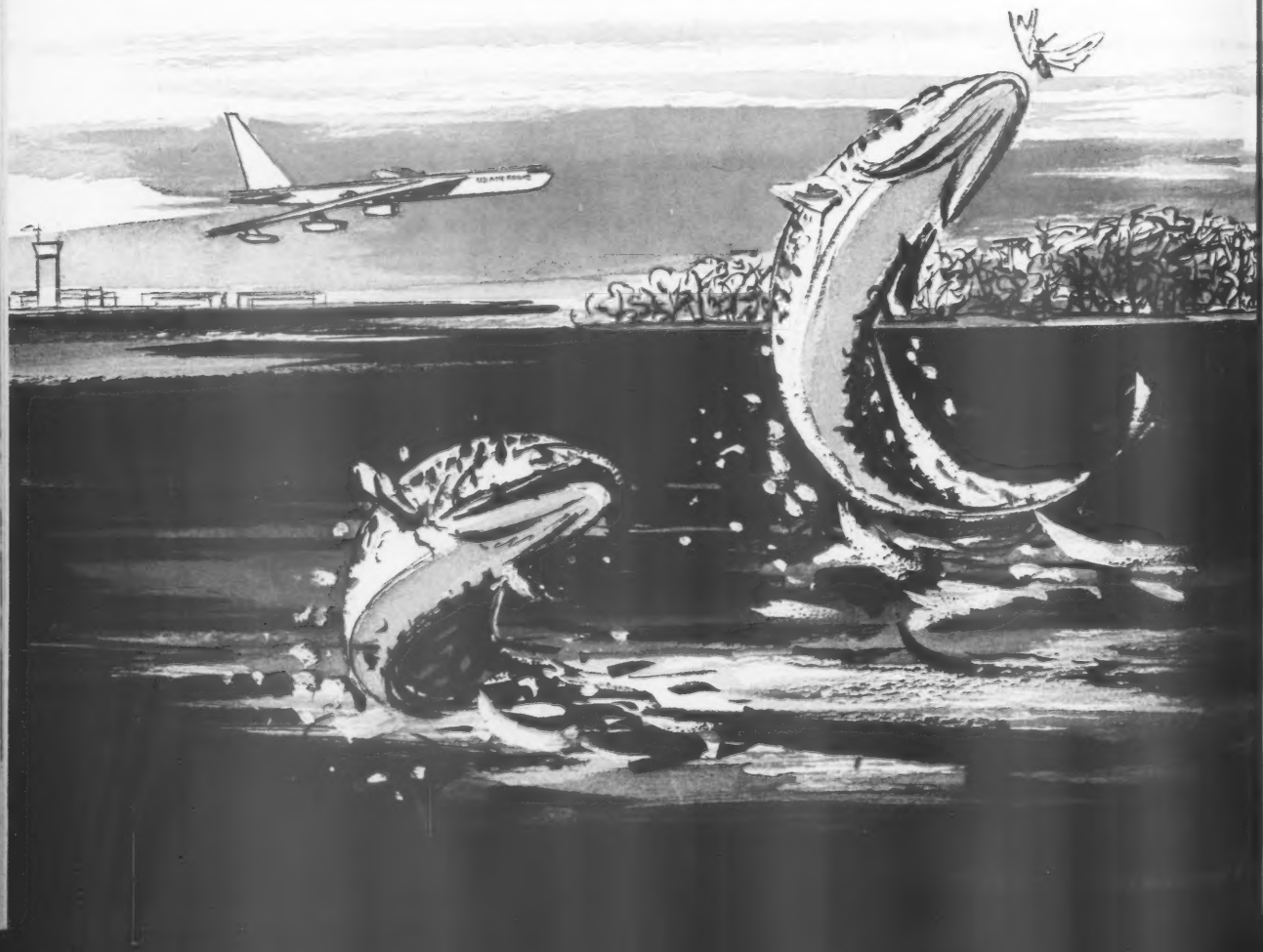
The new criteria insures that the *Mark of Missileers* is worn by those of demonstrated ability in this new and vital aspect of America's defense.

Accuse not Nature! she hath
done her part;
Do thou but thine!
PARADISE LOST

Woods, Waters, and Wisdom



by TSgt. John K. O'Doherty, *Airman Staff*



Conservation of our natural resources is the responsibility of every American. The Air Force, as custodian of large areas of open terrain, has a particularly important obligation in this respect. We are morally bound to apply sound management concepts in the use of lands entrusted to our care so that the treasures of our great National heritage may be preserved intact. This is a debt we owe to future generations.

ROBERT F. BURNHAM, Brig. Gen., USAF
The Provost Marshal

FISHERMEN and hunters on Air Force installations from Maine to Texas are finding their sport more exciting and rewarding these days. Thanks to the Air Force Fish and Wildlife Conservation Program established in 1956, areas once inhabited only by half-starved reptiles, the lower orders of insects, and maladjusted scorpions now teem with the flourishing life of forest and stream.

The interesting things that have been happening, for example, at Matagordo Island off the coast of Texas are indicative of the intense interest this program has engendered. When the 4004th Air Base Squadron moved out to the island to set up housekeeping for target range activities some time ago, they found themselves on a windswept, barren sandspit miles from the mainland. There was barely enough fodder and cover to sustain the snakes, and the treeless waste discouraged most other forms of life. Wild birds occasionally stopped there to rest, but moved along as quickly as possible.

Yet today the island is an established recreation center offering excellent hunting to moderate but growing numbers of enthusiasts. Ten thousand multiflora rose plants provide cover for quail. Blue panic and sunflower, meadow foxtail and Mediterranean salt grass, grow in sheltered areas. More than 200 food patches offer food for deer and some 34 fresh-water ponds abound with nesting waterfowl.

Wild turkey occupy roosts built from scrap material to overcome the absence of trees. The turkeys don't know the difference, but they actually sleep in greater safety as the supporting poles of their roosts are encased in cans or oil drums to frustrate surprise attack by climbing enemies.

Airmen at Matagordo are honored that some members of the famed but woefully small band of whooping cranes winter on the island. No gunfire is permitted within five miles of their resting place, but spectators may view the curious birds through binoculars from an observation tower.

The wildlife program at Matagordo was inaugurated as a modest venture financed by voluntary contributions from members of the squadron.

As long as there has been an Air Force there have been large numbers of airmen interested in outdoor activities, and the percentage of sportsmen in military service is considerably higher than that of the population in general. Even in the earliest days—back when it became evident that the operation of airplanes is inevitably linked to large areas of real estate—many bases conducted extensive independent conservation programs to protect fish and wildlife and safeguard natural resources. Some met with considerable success, and the present generation of sportsmen is reaping the harvest of those pioneer efforts.

General White's Letter

The current coordinated program embracing the entire Air Force can be traced to a letter written in July 1956 by the Chief of Staff, General Thomas D. White, an ardent practicing sportsman and a staunch supporter of intelligent, constructive conservation. In this letter General White pointed to the tremendous responsibility for natural resources accruing to the Air Force as custodian of 26,000 square miles of territory in the United States—including Alaska—and directed the creation of a positive, definitive conservation program covering the entire cycle of plant, animal, and fish life. The requirement was relayed, through The Inspector General, to The Provost Marshal, who thus assumed responsibility for a wildlife area greater than all existing Federal refuges combined.

One of the first steps taken by the Air Force in getting the new show on the road was to employ an advisor equipped with broad technical understanding and years of practical experience in conservation work. This advisor—Special Assistant to The Provost Marshal—and a military officer qualified in forestry and allied fields, constitute the professional staff of the fish and wildlife program at the Headquarters USAF level.

Another broad step forward was the negotiation of an official agreement between the Air Force and the U. S. Fish and Wildlife Service of the Department of the Interior. Under this agreement of December 1956, the Fish and Wildlife Service undertook to provide all possible technical advice and assistance in preparing fish and wildlife development and management plans, including guidance in construction and care of fishing waters, improvement of habitat, stocking of suitable fish, predator control, planting of food for wildlife, and similar practices.

For its part, the Air Force agreed to carry out plans

approved by the two agencies, including the orderly harvesting of the fish and game crop insofar as this might be done without impairing the basic military mission. In the same agreement the Air Force and the Fish and Wildlife Service pledged themselves to the utmost cooperation with State Conservation Departments in the development and conduct of programs.

Responsibilities Assigned

The base level conservation program is established by AFR 125-5, which provides for organization of a committee—appointed by the commander—composed of representatives from the provost marshal's office, installation engineer, operations, judge advocate, special services, information officer, ground safety, and the Rod and Gun Club.

Although the provost marshal is usually charged with monitoring the program, chairmanship of the committee is generally assigned by the commander to an individual endowed with an active interest in hunting and fishing. The Base Conservation Committee has available to it the assistance and advice of the State Conservation Department, the U. S. Fish and Wildlife Service, and the Fish and Wildlife Office of the Provost Marshal at Headquarters USAF.

At the end of three brief years of existence the Air Force Fish and Wildlife Conservation Program can already point with pride to a significant record of accomplishment, indicating that not only is the coordinated effort off and running as a going concern but shows definite promise of attaining permanent major stature. At its annual convention in 1959 the National Wildlife Federation—foremost educational group of its kind in the country—introduced a resolution commending the Air Force on its achievements.

Statistics covering a recent twelve-month period show that more than two million trees were planted on land under Air Force control; a million fish were used for stocking or re-stocking of lakes and streams; and seed plots comprising 34,000 acres were planted with food for wildlife. In the same period, expanses of land made available and suitable for hunting were increased by 700,000 acres, bringing the overall total acreage to more than a million and a half. Well over 1,200 acres of bankrupt fishing waters were reclaimed to usefulness by chemical control of vegetation and fish.

Eglin's Record

Showpiece of the military conservation program is Eglin AFB, Fla., with its 800 square miles of semi-tropical swamp, woodland, sand, and waterways. The conservation program extends over 407,000 acres of forest and 500 acres of water. Its success—generally recognized as approaching the spectacular—can be attributed to a number of factors, not the least of which are the active cooperation of civilian communities in the area and the vigorous support of State and Federal authorities.

By an Act of Congress, officials at Eglin are authorized to issue special permits to all sportsmen—military and civilian—who wish to hunt or fish on the reservation. The proceeds from these permits are ploughed back into projects supporting overall conservation goals. The effectiveness of conservation measures and good management techniques is attested by the steady increase in fees collected each year. In 1959, these amounted to about $25,000.

Among the notable projects made possible—in part—by annual permit fees is the creation of 22 artificial lakes on the reservation which are stocked with bass, bluegill, bream, and crappies. Some 200 meadows of two acres each are planted with oats, wheat, and rye to provide food for deer in leaner months. During the period of military management of wildlife at Eglin the deer population has grown from 2,300 in the original herd to something over 12,000 in the most recent census. Colonies of ducks, quail, wild hogs, and black bear flourish at Eglin under the protection of the conservation program.

In September of 1958 a Fish and Wildlife Conservation Program was established at the Air Force Academy and the 18,000-acre site was designated a wildlife management area. The State of Colorado has entered into an agreement with the Academy to assist in the application of good conservation practices to insure optimum development of the area.

The first official deer season was opened at the Colorado reservation on a cautious, exploratory basis in the fall of 1959. Hunting spaces were rigidly limited and were allocated to cadets, base personnel, and a few of the neighbors by a process of drawing lots. The total yield of 60 animals harvested was considered eminently satisfactory by all concerned.

When members of the Rod and Gun Club at Maxwell AFB became interested in raising quail, they

built improvised incubators from whatever excess material could be found, and waited in suspense while the eggs traversed through the leisurely process of hatching. A neighboring farmer heard of the project and donated the use of 1,500 acres of fallow land. The airmen planted the area with patches of lespedeza so that the young quail might mature, multiply, and flourish in natural surroundings. They posted the land as a game refuge and the success of the venture earned whole-hearted commendation from sportsmen for miles around.

The major conservation programs in operation at such places as Dow, Otis, Loring, Eglin and Elmendorf are clearly impressive, but dozens of smaller installations carry out modest activities that are equally productive in relation to the opportunities available. Dr. W. K. Gregory of the American Museum of Natural History describes man as the most destructive animal ever to walk on the face of the earth and there is work for the conservationist anywhere beyond the boundaries of civilization's concrete and asphalt strongholds.

Cooperative Effort

Conservation—ideally—is indivisible and the exercise of good conservation practices on military reservations enhances the general well-being far beyond the boundaries of perimeter fences. Civilian sportsmen are encouraged as a matter of general policy to make use of Air Force hunting and fishing facilities—where safety and the military mission will permit, and where the available harvest of fish and game is sufficiently abundant. This policy tends to reduce excessive pressure on non-military hunting and fishing grounds which are being progressively diminished by encroaching highway programs and suburban development.

The pursuit of conservation goals as a National effort is further fostered by the harmonious relationship existing between the Air Force and State, Federal, and National conservation agencies. Good, solid understanding at the operating level often provides an opportunity for one hand to wash the other.

When the U. S. Fish and Wildlife Service needed specimens of Arctic grayling and blackfish for its famous educational exhibit in Washington, D. C., the knotty problem of transportation posed a formidable obstacle. Obviously, the fish could never survive such a long journey over the road, and the facilities of commercial air carriers could not be adapted to the circumstances. Space was found on an Air Force transport bound for Bolling AFB and the fish made the trip in fine style with a Federal biologist checking water temperature along the way. Today these curious fish stare back at the faces of curious school children filing past a glass-enclosed tank in the main building of the Department of Commerce.

There are a number of reasons for the active and intense interest in conservation demonstrated by the Air Force over the years. Some are based on the purest of practical considerations; others are inspired by more lofty motives.

One of the more obvious important dividends resulting from good conservation management is the unsurpassed recreation afforded to airmen by good hunting and fishing. In this age of technology, mental and emotional strains have become a part of everyday life and there is no better release from tension or outlet for dammed-up pressure than the restoration found in healthful outdoor activities.

As a community relations instrument the conservation program ranks high. There are 30 million licensed hunters and fishermen in the United States, plus additional untold thousands of nature-lovers of all types, degrees, and descriptions. Every one of these millions of people supports and applauds constructive conservation of natural resources.

Probably the most important factor justfying a sound and enduring conservation program is the simple matter of good citizenship. It is unfortunate that the history of the United States is studded with incidences of short-sightedness and failure in this respect. The American bison, to cite one example, ranged over a third of the continent for ages in herds that added up to more than 60 million head. By 1890 they numbered barely a thousand animals. The efforts of conservationists have since restored the herds to about 40,000.

Since the dawn of Christianity on the so-called civilized world some 106 different species of mammals have disappeared from the face of the earth according to the estimates of biologists. Their disappearence can be attributed almost entirely to the depredations of man. It took nearly 1,800 years to get rid of the first third of these animals. The second third was disposed of in the hundred years of the 19th century. The balance—about 35 or so species of animals—were wiped out in the first 50 years of the 20th century. Nice going!

The full effectiveness of any broad conservation program can be measured only from a long-range vantage point of distance in time. Future generations will benefit if intelligent action in the present moves to correct the mistakes of the past. The crusade to combat soil erosion, pollution, waste, and man's general improvidence in his relationship with nature will help to preserve—and perhaps enhance—the heritage that belongs to posterity.

SLANTS ON SPACE

/// Eclipses come in cycles of 18 years, 11 days and 8 hours, or one day less if the span includes five leap years. Each cycle averages 29 lunar and 41 solar eclipses, 10 of the latter being total. At the conclusion of a cycle, known as a *saros,* Moon and Sun return to the same relative positions in the heavens and the entire eclipse series recurs in about the same sequence as the previous one, but each approximately 8 hours later and with the zone of visibility shifted 120 degrees west from the point where the preceding cycle's eclipse took place.

For example, 1960 has two total eclipses of the Moon—the one of March 13, visible in most of North America; and the one due September 5, whose beginning only will be visible in North America. Come 1978 (or 6,685.32 days later) there will be a total lunar eclipse on March 24, visible in Southern Asia and Australia, and another on September 16, visible in most of Africa and Southern Asia.

When eclipses recur, there are slight variations such as the duration of totality, the area blacked out in a partial eclipse, etc. Thus the 1960 eclipses totality periods of 96 and 90 minutes respectively will change to 90 minutes for the first and 82 for the second.

That eclipses occur in orderly, predictable sequences was known to man long before the advent of the Christian era, for how many centuries no one yet knows. Records from ancient Chaldean astronomers going back beyond 600 B.C. show the *saros* was used in their calculations. The fact speaks for the great care with which many earlier watchers of the heavens must have applied to their work and the lengthy stretches of time that must have elapsed before the cycle's reliability was positively established.

The term *saros* is a Greek adaptation of the original Assyrian-Babylonian word which meant sixty sixties (3,600) and applied both to days or centuries. Mystifyingly, however, it did not have that numerical value in the ancient eclipse calculations. Suidas, a noted lexicographer of the 10th century A. D., translated the word as signifying the accurate time values involved. From this source the term subsequently came into the English language.

Several writers have used the *saros* as a handy device for getting story characters out of tight spots because of their foreknowledge of the eclipse cycle. Such fictional flights have historical precedent. One case involved Christopher Columbus in 1504. He was on Jamaica, in the West Indies, when the natives there balked at furnishing further provisions for his crews. A great navigator who knew his heavens, Columbus was aware the *saros* would bring a lunar eclipse in a few days on March 1. Accordingly, he warned the aborigines unless they cooperated he would make the Moon "change her color, and lose her light." The Moon blacked out on schedule, filling the superstitious natives with fear and panic. So relieved were they when the eclipse ended, they hailed Columbus as a deity and the island caused no more supply worries.

/ / /

/// The first made-in-U.S.A. planetoid will reach aphelion on October 1 when its orbital swing carries it to the point of maximum distance from the Sun and this is placed at about 106.1 million miles, according to latest calculations. Preliminary forecasts in March had September 29 the probable aphelion date.

Launched on March 3, *Pioneer IV* reached perihelion, or its closest approach to the Sun, estimated at 91.7 million miles.

(Comparable figures for the Earth are 94.45 million miles at aphelion; 91.34 million at perihelion.)

Pioneer IV's orbital velocity averages approximately 60,000 miles per hour as against 66,000 m.p.h. for our globe. To complete a full revolution about the Sun the planetoid will take over 13 months.

Intended as a lunar probe, the vehicle's trajectory carried it no closer than 37,300 miles of the Moon's surface. The research instrumentation in its payload was set to be triggered at a distance not exceeding 20,000 miles.

Pioneer IV, however, gathered valuable data on the new radiation layers beyond the Earth and set a new space communications record with signals which enabled tracking stations to follow the vehicle for 82 hours to a distance of 407,000 miles.

/ / /

/// Can a diet be devised for building up resistance to injurious radiations found in space? Some preliminary affirmative evidence has been developed in laboratory experiments with guinea pigs. One group of the animals was fed the regular diet of bran, oats, dehydrated vegetables, and powered milk, then exposed to heavy radiations. None survived longer than 15 days. Another group was placed on a diet which included large amounts of broccoli and subjected to the same radiation. Only one animal out of three failed to live through the 15-day experiment. Generous amounts of cabbages in diets had a similar beneficial effect. When mustard greens were substituted the protective effect was even more enhanced. Research workers noted that the greens caused both decreases and increases in the amounts of various body chemicals, a possible indication that the key to resistance may be in the enzyme system. Enzymes are organic compounds secreted by animal and vegetable cells which cause chemical changes in the substances on which they act. Enzymes influence digestion, oxidation, and other metabolic processes.

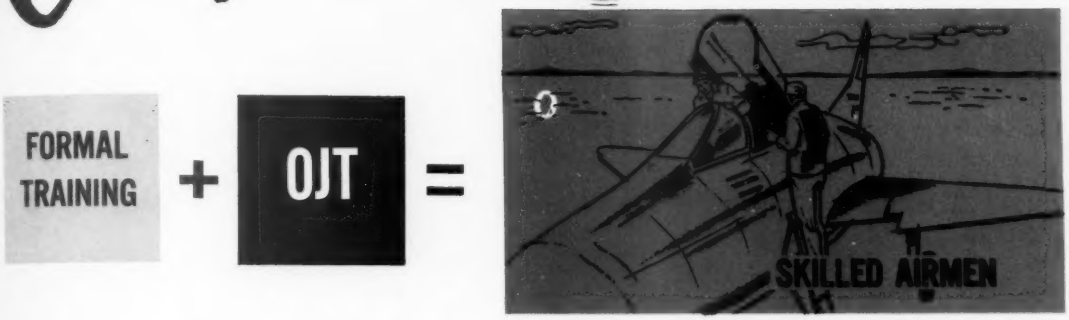
It is believed that comparable diets would have much the same results with human beings in building up resistance to potentially harmful radiation outside the protection of the atmosphere.

—WILLIAM A. KINNEY

in my opinion

(Editor's Note: The opinions expressed herein are those of the author and do not represent the views of this magazine or the United States Air Force. *In My Opinion* is presented as a medium by which members of the Air Force may discuss their views on various subjects.)

Complacency in OJT



by Richard K. Hale, *Eglin AFB, Fla.*

OJT! Its meaning as we all know is *On-The-Job-Training*. If properly utilized, it can be the most effective tool in mission accomplishment at all echelon levels.

AFR 52-2 implements Air Force OJT and lays down the responsibilities therein. I think everyone governed by this regulation is aware of his established responsibilities; however, this is as far as it goes. Most NCOs and group and squadron commanders seem to treat OJT as a necessary evil rather than an absolute necessity. They are willing to let their respective OJT programs just coast along hoping that everything will come out in the wash.

In most organizations OJT appears to be a hit and miss affair. An airman in training is like a ring on a merry-go-round. Maybe the supervisor will grab him this time around for training and maybe he won't. Most likely he won't. He will probably tell the trainee that he doesn't have time to train him this week and that he will get around to it next week. "Study your package program for awhile."

This sort of thing goes on and on. Consequently, Airman Doe is put on the carpet for lack of progress. He is not only surprised at this action, but he is burning around the ears too! Justly so, because it is no fault of his. The poor guy has been trying but he has not received any help. Airman Doe is just one case in a thousand. Probably after two years he may pass his APT and be awarded a 5-level AFSC. But is he truly a skilled airman? No! Because he has received most of his training out of a book, has never been rotated, and received very little guidance on the job.

The secret of an effective OJT program that produces fully qualified airmen is a systematic rotation program for all trainees. A supervisor cannot honestly sign the certification block on the trainee's AF Form 623 if he does not rotate his trainees. Yet it seems to be common practice to sign off the training as completed even though the trainee has worked only in one small facet of his AFSC. An airman cannot possibly become a fully qualified person unless he has been rotated.

The point I'm trying to put across is this. The Air Force OJT Program is not being carried out as directed in AFR 52-2. Group and squadron commanders should back the program to the hilt. They should exert every means at their disposal to assure that a realistic and effective OJT program is kept in operation; and if necessary, take punitive action against any and all NCOs who do not carry out the program to the letter. Until positive action is taken, the Air Force OJT Program cannot possibly accomplish what it is designed to do.

Many manhours and dollars are lost each day in the Air Force simply because commanders and NCOs are reluctant to take enough interest in their OJT programs to assure that trainees become skilled airmen in the shortest possible time. We should all strive to increase production and reduce costs. This can be realized through an effective Air Force-wide OJT Program.

The Falcons' New Nest

HERE are the facts about the worldwide Air Force drive to raise funds this month to build a "new nest" for the homeless U. S. Air Force Academy Falcons.

Ever since the Academy moved to its new site at Colorado Springs in 1958 its gridiron squad—your football team—has been without a stadium. So the Air Force Academy Foundation, a nonprofit organization, is holding a drive with Air Force cooperation from April 15 to May 15 to raise money for its construction. Officers, airmen, and civilians will have an opportunity to participate in the drive to provide a 40,000-seat stadium.

Cost of the ultramodern stadium, situated near the Rocky Mountains, is estimated at $3,500,000. One million dollars is expected to come from active-duty personnel, while civilians will donate the remainder.

The large stadium is designed for the convenience of both spectators and participants. Five nearby parking areas, no more than four minutes' walk from the stands, will accommodate 8,700 cars and 300 buses. All stadium seats will have an unobstructed view of the playing field. Seventy-five percent are planned on the west side of the field.

Each deck of the three-level bowl will be complete with restrooms and food concession booths. The entire stadium can be emptied in less than 15 minutes by convenient "exits."

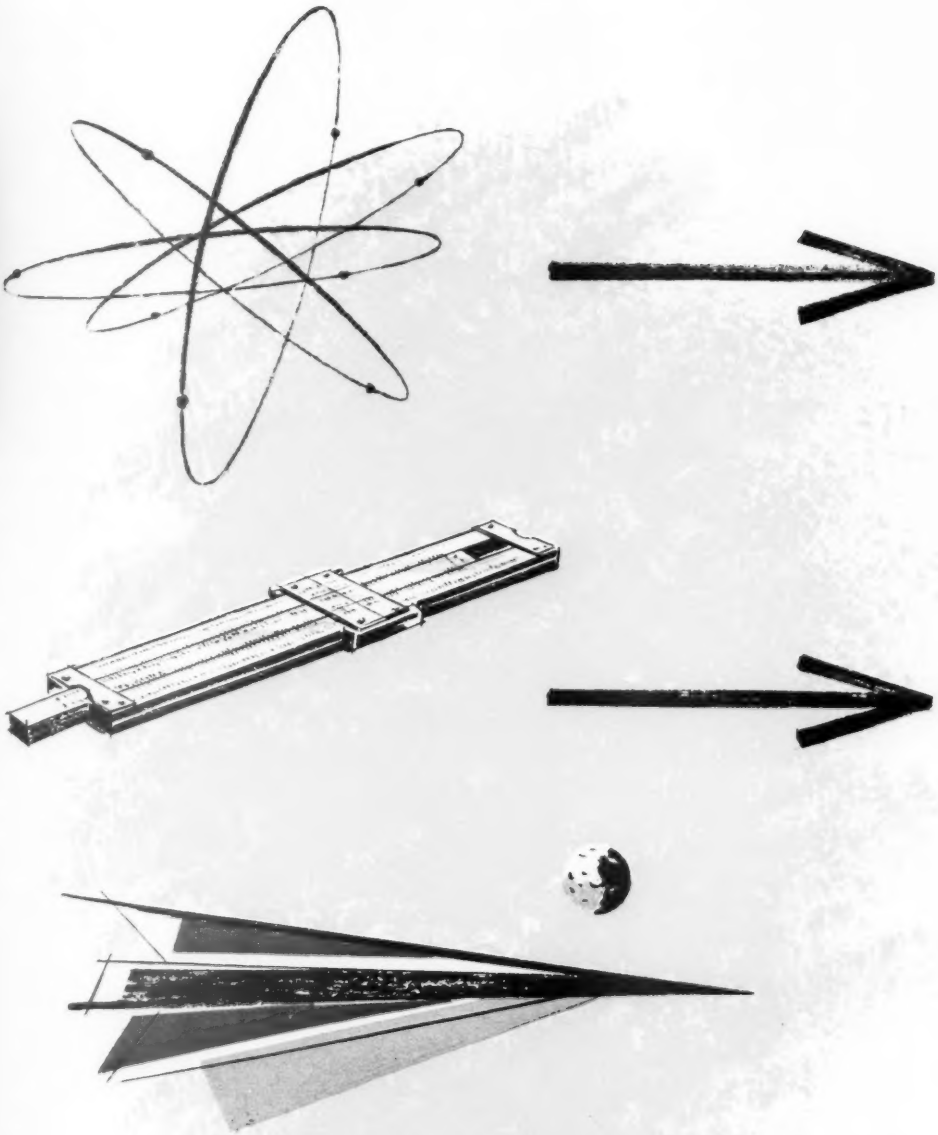
Other features will make the stadium one of the best-equipped in America. Some 3,500 square feet of inside floor space will provide locker rooms and shower stalls for players and special offices for coaches.

In the design an enclosed press and radio room is located atop the stands, also on the west side of the field. There will be room for 105 reporters' desks in three rows. Seven radio booths will be located there. TV camera pits for network television coverage are nearby.

A two-acre marshaling area is provided near the stadium for pregame cadet formations. From here cadets enter the stadium through a tunnel onto the playing field. The Cadet Wing will be seated in the lower middle section.

All special seating areas and the press box are to be made of steel. The rest of the stadium will be built of reinforced concrete. Construction and design of the stadium is tailored to the natural bowl landscape of the terrain.

The stadium will "belong" to both the Air Force and the Academy since the cadet team represents the Nation's air arm in intercollegiate sports. In charge of stadium construction is the Air Force Academy Foundation, an organization which promotes academy development by raising funds for activities not provided for by appropriated monies. Approval for construction of the privately financed stadium was granted the Air Force in 1956.



That nation, or group of nations, which maintains predominance in the aerospace—not only in its military forces but also in its sciences and technologies—will have the means to prevail in conflict.

AFM 1-2

I am an Airman . . .
My coveralls are splotched with sweat and grease;
Sometimes my sleeve is plain or a chevron wears,
Yet on my shoulders I may bear proud stars
Or bars and leaves of silver, gold—
And perched poised eagles.

Untiring alert I stand,
One foot braced in the good earth
Of this, my bounteous country,
The other placed with careful stance
In far-off places strewn across the world,
Lands of many climes and tongues—
And homes, all spared the dread of total night
Because of me.

I am the Keeper of tranquil horizons,
Sentinel to wondrous reaches in the skies—
So high, wide . . . and lonesome
In majestic grandeur.

I am the Pioneer for opening up new realms,
Pushing back frontiers of Time and Space
Until Distance now becomes an easy span.
I have thrust aside the barrier of sound
Like the light-swift parting of curtains
Mantling an untrod stage with breathless vistas.
I have ventured deep beyond . . .
Ever questing, ever seeking.
I have trampled flat the brambles
Of the thermal thicket—
Moving, groping, reaching toward
The awesome secrets in that spangled vault
Of shining galaxies
Which course the voids around our little globe.

In choiceless, all reluctant hands
I hold the most horrendous power
To beggar man's imaginings—
The dire instrument of utter last resort
For visiting retribution,
If full and grievously provoked
By naked, wanton, calculated offense
Against any in the goodly company of mankind
Who strive today anew to dwell
In calm and helpful harmony.

What matters if those arch, deluded minds
Of brutal foul intent
Shrill calumnies to assail me
And impute like infamous designs
They would themselves pursue
For freedom's rape in ruthless conquest.
They plot on, coveting to add new spoils,
Yet falter to risk the further steps
Because of me—and the night of godless horror
Is held back and does not fall . . .

What I must in duty hold is held not carelessly
But in gravest, solemn trust
Which I am pledged to loyally attend—
So help me God!
May He, in gentlest mercy, vouchsafe
This duty be confined to simple custody
And solely that alone—henceforth
Until the last finite second dies:
My hands would know their truest happiness
In the shy, dissolving grip of childish fingers,
The prayerful touch of any sore beset by need,
The warm, glad clasp of neighbor, friend . . .
These are my people everywhere
Whom I delight to knowing serve.
To them I own the same allegiance true
I bear Creator, conscience, and country
In the deathless cause of Liberty.

I am sprung of many parents, many lands,
From that host of myriad, diverse origin
Whose toil, hopes, skill and eager genius
So painstakingly wrought the unmatched greatness
And golden legend of our Nation.
Me they have endowed above history's measure
With the copious treasures of all cultures,
The priceless stores of knowledge and wise lore
Amassed thru slow-crawling centuries now done.
With these forebearers and such a heritage,
I can nowhere be a stranger . . .

I am an Airman.
I am the New Breed.
Its honor I hold,
Its faith I sacred keep . . .

—WILLIAM A. KINNEY